

Pr CW SAMPLE COPY UNIVERSITY MICROFILMS  
MAY 11 1973 SERIAL PUBLICATIONS  
300 NORTH ZEEB RD ANN ARBOR MI 48106

# COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper

Second-class postage paid at Boston, Mass., and additional mailing offices

May 9, 1973

Vol. VII, No. 19



J. Robert Ippolito, director of the Central Management Information Center, receives an award from Milton J. Shapp, governor of Pennsylvania, for his work in saving thousands of data tapes at the state's computer center during the floods of Tropical Storm Agnes last June.

## For Flood Recovery

## Governor Commends Crew

HARRISBURG, Pa. — The director of this state's computer center was recently awarded for his role in saving thousands of data storage tapes when the center was hit by severe floods from Tropical Storm Agnes last June [CW, June 6].

J. Robert Ippolito, director of the Central Management Information Center, received the award from the governor for "economic and cost conscious achievement."

"I am pleased to single out Ippolito and the members of his staff for their work, judgment and foresight during the flooding crisis," the governor said.

(Continued on Page 4)

## Secure and Accurate?

## Most Vote Officials Seem Content

CW West Coast Bureau

LOS ANGELES — Although there have been many stories about inaccuracies and security breaches in computerized vote counting systems, most county election officials seem to be unconcerned about the problem.

At least that is the conclusion drawn from a survey of county election systems prepared a year ago and just released by Systems Research Inc. here.

The survey also found that in spite of claims of reducing costs of elections, punched card voting systems were actually more expensive to operate than

lever-type voting systems, even though both systems were found to be cheaper to operate than paper ballots.

In the security and accuracy area, county election officials using punched card systems rated their equipment as 100% accurate and secure, the report said, compared to paper ballots which received only an 83% "good" rating in the accuracy category and only a 75% "good" rating in the security area.

### Faith in Machines

"It is interesting to note the apparent lack of impact of the fairly recent controversy surrounding security of computerized vote counting systems," the report noted. "Officials apparently still find it easier to place their faith in a machine and its faceless operators than in a wholly flesh-and-blood vote tabulator," the report added.

The survey also found "none of the hostility anticipated with the advent of the punched card is reported by the election officials," noting that 82% of the officials said public acceptance of the systems had been good.

At the same time, however, the survey found the lever-type voting machines had a better

## Telex Witness Claims Software Locks Users to IBM Processors

By E. Drake Lundell Jr.

Of the CW Staff

TULSA, Okla. — Computer users become wedded to their suppliers because of the huge programming investment and the incompatibility problems of changing from one vendor to another, a user witness told the court here last week as Telex neared the end of its presentation in its \$1.2 billion antitrust action against IBM.

James Martin, DP manager at

Court documents show IBM studied profits and discounts of its fixed price leasing plan. See story on page 31.

the First National Bank of Louisville, Ky., testified that software compatibility ties users into the central processors of one manufacturer, especially after making substantial software development expenditures.

In other action in the case, Telex witnesses relied almost solely on internal IBM documents to try to prove that IBM had tried to bankrupt companies in the plug-compatible marketplace and to prove once again IBM's dominance in the market.

Martin indicated his bank had a

"considerable investment" in programs written for IBM processors and that it would have to make a "very large expenditure" to switch to another company's mainframes.

### Translators Work But . . .

Even though many of the other manufacturers talk of translators for converting programs written for IBM machines to their systems, Martin noted these only work for part of the program and the remainder would cause

the user problems.

Because of this, the user would have to get a "tremendous" savings from the other equipment, he said, in order to justify making any change.

In addition, Martin testified the only real competition had been in the plug-compatible area since that was the only major non-IBM equipment his bank had considered since going to the 360/370.

(Continued on Page 2)

## Apollo, Iceberg, Midas... The Future IBM Disks?

By E. Drake Lundell Jr.

Of the CW Staff

TULSA, Okla. — In order to try to clarify some of the confusion over the code names used for various products in the IBM court documents, Computerworld has sorted out the documents and projected IBM future products in the disk area.

Here is the present line-up:

The IBM Merlin file referred to in many of the documents has become the 3330 which was introduced in 1970 with a capacity of 100M byte/drive and a data transfer rate of 800 kbit/sec.

There are presently two improvements being made to the 3330-type drive: Iceberg and Midas.

Midas, which is expected to be announced at any time, is a 50M-byte file or half-capacity 3330, and involves no change in technology over the 3330, according to IBM source court documents introduced here.

The half-capacity on the Midas file will be achieved by reducing the number of disks per pack and a new pack type will be created and marketed by IBM for this device, it is understood.

The device is intended for the small, medium and intermediate systems markets and the primary users will be small 155s, 145s and the larger 135s.

However, the decision to push the Winchester type drive, which has been announced as the 3340 direct access storage facility, may delay the introduction of Midas since they

(Continued on Page 2)

## Prove Need to Upgrade: GAO

By Don Leavitt

Of the CW Staff

SAN FRANCISCO — Installations can no longer justify requests for new computers solely on the basis of an economic analysis, and "the simple fact that present equipment is in use 24 hours a day, seven days a week" isn't enough justification either, a computer systems analyst for the General Accounting Office (GAO) warned here last week.

Keynoting a meeting devoted heavily to computer performance evaluation (CPE) tools and techniques, Dennis R. Chastain told managers of government DP sites, "Performance monitors can be utilized in evaluating existing systems to determine if requests for additional components or systems are justified."

### Policy Change?

This represents a tentative policy change for GAO, he admitted, adding that in time he would like to see the "must" in place of the word "can" to give the statement some teeth.

He reminded the audience that GAO had issued a report in August 1972, which reviewed the use of CPE in government installations at that time, and recommended that the Office of Management and Budget direct heads of Federal agencies to "consider using" CPE to improve the efficiency of computer performance, especially before acquiring additional computer capacity.

GAO recently completed a research and development effort to determine the practicality of utilizing performance monitors to audit the efficiency and effectiveness of government DP sites.

"Our initial conclusion is that these tools will be a considerable aid to our auditors," he said. "GAO is preparing now to use [CPE] in an actual auditing situation to further establish . . . the procedure. If successful, GAO will use monitors on a more widespread basis."

When finally implemented, this "efficiency and effectiveness" auditing will be a more penetrating

(Continued on Page 4)

### On the Inside

Complete List  
Of NCC Sessions —Page 6

Papers Reveal IBM/360  
Market Penetration  
From 1967 to 1969

—Page 35, 36, 37

Communications . . . . 19  
Computer Industry . . . . 31  
Editorial . . . . . 10  
Education . . . . . 29  
Financial . . . . . 42  
Societies . . . . . 27  
Software/Services . . . . 15  
Systems/Peripherals . . . . 21

## At IBM/Telex Trial

# Economist Says IBM Has Clear Peripheral Dominance

By a CW Staff Writer

TULSA, Okla. — The economist testifying for Telex in its suit against IBM said last week that the "census" IBM had prepared for the Control Data case clearly showed IBM had a dominant market position in the peripherals business.

Dr. John Bonham, doctor of economics and professor at Tulsa State University, also told the court a monopolist was one who had enough market power to be able to do anything it wanted without fear of competitive reaction.

"It is the giant-pygmy concept," he said, noting the large company could take an action and force all of the smaller ones to react to it in a monopolistic industry.

In addition, he said, this type of market power allowed the giant firm to practice market price discrimination because it allowed it to lower prices in one area and then raise them in another in order not to have lower revenues across the board.

A monopoly can also change interfaces on products in its middle life, he indicated, forcing all the other firms to react

to it.

The monopoly firm, he noted, also earns monopoly profits that are higher than they should be and which in turn allow more research and development. This "thing feeds on itself after a period of time," he noted.

Using data from the census IBM had prepared of more than 2,700 firms in the computer business, Bonham said those figures show IBM had 95.5% of the tape business at the end of 1970 with the rest of the competitors having only 4.1% at that time.

At the same time, he noted the IBM market share was probably understated because many of the other firms sold more equipment than they leased while IBM leased the majority of its equipment.

Outright sales tend to increase revenues the year they are made while leases defer them over a longer period of time. He indicated the census figures were based on firms' revenues and not number of units in the field.

In the memory area, Bonham said in 1970 IBM had 98.8% of the market with the remaining 1.2% split among five other companies.

In the printer market the situation was much the same, he said. IBM had total

revenues in this market of almost \$194 million where its nearest competitor had revenues of only \$271,000, he said.

In the overall peripherals area, he said the census figures show IBM had 91.8% of the market while its competitors had 8.2% of the market. He again added that the IBM percentage was probably understated.

### Efficiency Measured

In another analysis, Bonham compared the ratio of the net income before taxes divided by sales as a measure of the efficiency of a firm. He compared IBM with several other firms of different sizes in different industries to see how well their performance measured up.

IBM, he said, had a 24.5% ratio in this category which was higher than any other firm.

He said over the last 20 years the IBM ratio had varied very little, showing that its earnings had a very stable growth and were not affected by business cycles as its competitors' earnings were.

This type of stability, he said, indicates the firm has the ability to control its own future and its own life.

In another comparison, he said IBM's return on investment figures were very

good even though they were not the highest of all the firms measured. Again with this measure he noted the IBM variation of return on investment was very small which indicated that it had good stability in its marketplace.

### Summary Judgment Motion Expected

TULSA, Okla. — Telex was expected to end its presentation last week in its \$1.2 billion antitrust suit against IBM.

Before IBM begins to present its case, it is expected the firm will move for a summary judgment rejecting the Telex claims which should be considered early this week.

In the Greyhound vs. IBM antitrust suit, the judge, in a decision that is being appealed, granted the IBM request for summary judgment and IBM was never required to present its defense.

Sources here feel Judge A. Sherman Christensen will not grant the IBM request and will make the firm present its defense, which should begin early this week.

## Witness Claims Users Locked to IBM

(Continued from Page 1)

The main reason for going to the independents, he noted, was to save money, even though there were often slight performance improvements with the independent devices.

There really is no choice in the CPU area, he said, because none are compatible, but users have a definite choice in

the peripherals area today, he said.

On cross-examination, however, IBM attorney David Boies got Martin to admit that just recently two banks in the Louisville area had switched the source of their mainframes, which seemed to indicate the switch might not be as difficult as Martin made out.

However, it was not brought out in

court that the two banks had switched from GE computer systems, made by a firm which is now out of the computer business.

Martin also said the cost of the software library was not necessarily the major consideration when deciding not to switch, but rather the problems of conversion in the field.

While converting from one system to another, he said, there are great problems and when 300,000 bank customers rely on you, you can't afford to have systems problems during a switchover.

In all, he said not only would a competitor have to offer a great deal of dollar savings to get a user to switch systems, but it would also have to give him functional advantages he could not get with IBM.

Earlier in the case, Berton Hochfeld, now with F. Eberstadt & Co., and formerly with IBM as a market analyst, said IBM knew that if it cut prices, forcing Telex to do the same, it would make Telex a marginally viable company and give it a great deal of trouble in paying needed financing.

In addition, he said IBM knew that the price cutting measures would have largely the same effect on other firms in the plug-compatible peripherals business when it made the move, and he hinted that IBM purposely made the move to dry up those companies' sources of financing and drive them out of business.

Thomas Barr, the lead IBM trial attorney, repeatedly objected to the Hochfeld testimony, claiming Hochfeld was only a low-level "pencil-pusher" while at IBM and therefore not qualified to speak for the company and its plans.

Barr also tried to introduce evidence that Hochfeld might be guilty of stock "scalping" in his new job, but the judge ruled that this line of questioning was irrelevant to the case.

### Calif. Software Tax Stayed

SACRAMENTO, Calif. — The State Assembly has passed with one dissenting vote a bill which would continue permanently California's moratorium on the taxing of software.

The measure is now being considered by the Senate Revenue and Taxation Committee.

Emergency legislation enacted last year exempted certain software from taxation as tangible, personal property but the exemption runs out this year.

## Papers Reveal Future Disks

(Continued from Page 1)

compete somewhat in the same market and because IBM decision-makers are putting more emphasis behind the Winchester program than the Midas program.

However, when and if Midas is announced, its price will probably be 60% of the 3330-type drive, according to the documents.

The other major development under way in the 3330-type drive area is called Iceberg and will be a double-density 3330 drive.

Reportedly the doubling of the capacity will be achieved in a manner similar to that used by the independents to double the 2314 capacity, according to the documents.

Twice the number of tracks would be written onto a single disk surface which would require a new head design with narrower track width.

However, the pack for an Iceberg will probably be different and unique from that of the 3330, the document said, since twice the number of servo tracks are required to be written on the servo surface.

Therefore, the documents say, the packs for the Iceberg will not be interchangeable with the present 3330 disk packs.

Both Midas and Iceberg are expected to have approximately the same stated transfer rate as the 3330.

The Winchester program, which saw its first product announcement in the 3340 [CW, March 21], is a completely new type of technology and is probably the forerunner of a new generation of disk drives.

The 3340 is available in two densities — 34.9M and 69.8M byte/disk

pack, but it is expected that IBM will upgrade the line with additional versions being developed under the code name "Colt."

The Apollo drive is for the future generation, 375 family of computers, according to the court documents.

Last week *Computerworld* incorrectly reported the capacity of the Apollo drive. The documents actually show that the Apollo drive could have up to 1,000M byte/drive and could have a data rate of 1.6M byte/sec, double the 3330 speed.

However, even though some IBM documents show this capacity, both testimony in the case and other documents indicate this may have been overly optimistic.

It appears now that the Apollo drive — at least the first Apollo drives — will have a capacity of approximately 400M byte/pack or double the planned double-density 3330.

At the same time, it is understood that the Apollo will probably use a non-removable disk pack from the customer's standpoint, with the pack removable only for service.

The Apollo is not intended for the 370 market, the documents show, but will be designated for the FS systems that are currently under development. FS is believed to stand for "Future System" which would be the 375.

Presently IBM has funded a full-blown development effort on the Apollo drive and even though it is slated for announcement in 1976 there is some indication that it could be moved up to 1975 and used as an enhancement on the larger 370 processors as stepping stones into the FS systems.

## COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

TM Reg. U.S. Pat. Off.

V.J. FARMER, managing editor. RONALD A. FRANK, technical news editor. EDWARD BRIDE, general news editor. E. DRAKE LUNDELL JR., computer industry editor. DONALD LEAVITT, software editor. MICHAEL WEINSTEIN, systems editor. MARY UPTON, staff writer. MARVIN ARONSON, chief copy editor. LESLIE FLANAGAN, JUDITH KRAMER, copy editors. PATRICIA M. GAUVREAU, MARGUERITE Y. ZIENTARA, editorial assistants.

ALAN TAYLOR, J. DANIEL COUGER, DAVID E. FERGUSON, FRANK GREENWOOD, columnists.

E. DRAKE LUNDELL JR., Washington bureau. J.H. BONNETT, European bureau.

NEAL WILDER, vice president — marketing. DOROTHY TRAVIS, marketing administrator. JUDY MILFORD, advertising coordinator. ELLEN FUSFELD, market research.

LEETE DOTY, production manager. HENRY FLING, production supervisor.

W. WALTER BOYD, publication manager. PATRICK J. MCGOVERN, publisher.

EDITORIAL OFFICES: 797 Washington St., Newton, Mass. 02160. Phone: (617) 332-5606. Telex: 92-2529. Washington: Room 1129, National Press Bldg., Washington, D.C. 20004. Phone: (202) 638-0901. Telex: 89-544. Europe: Computerworld, c/o IDC Europa Ltd., 59 Grays Inn Rd., London, W.C.1, England. Phone: 01-242-8908. Japan: Computerworld, c/o Shukan Computer, Dempa Building, 1-11-15, Higashi Gotanda, Shinagawa-ku, Tokyo 141. Phone: (03) 445-6101. Telex: 26792.

Second-class postage paid at Boston, Mass., and additional mailing offices. Published weekly (except: a single combined issue for the last week in December and the first week in January) by Computerworld, Inc., 797 Washington St., Newton, Mass. 02160. © 1973 by Computerworld, Inc.

Reproduction of material appearing in *Computerworld* is strictly forbidden without written permission. Send all requests to publication manager.

25 cents a copy; \$9 a year in the U.S.; \$10 a year in Canada; all other foreign, \$25 a year. MARGARET PHELAN, circulation manager. Four weeks' notice required for change of address. Address all subscription correspondence to circulation manager, Computerworld, 797 Washington St., Newton, Mass. 02160. u

COMPUTERWORLD, INC.

Patrick J. McGovern ..... president  
W. Walter Boyd ..... executive vice president  
Robert M. Patterson ..... vice president—editorial  
T. Neal Wilder ..... vice president—marketing

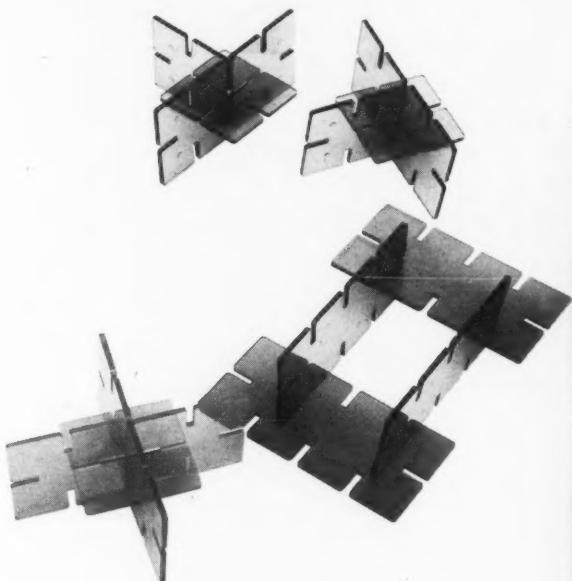


POSTMASTER: Send Form 3579 (Change of Address) to Computerworld Circulation Dept., 797 Washington St., Newton, Mass. 02160.

# IBM, UNIVAC and DEC users: **Tired of computer add-on double-talk?**

## **fact:**

No other independent supplier designs, manufactures and services all his computer peripherals—magnetic tape, disk and mainframe memory enhancements.



## **fact:**

Ampex computer peripherals cost up to 40% less than OEM's such as IBM, Univac and DEC.



## **fact:**

Nobody makes more reliable computer subsystems.



## **fact:**

You can't get better performance and human engineering than are offered by Ampex peripherals.



## **fact:**

No peripheral manufacturer is more concerned with computer-room space restrictions.



## **fact:**

No independent offers better service, worldwide, on its products.



These facts add up in your favor. In Ampex tape, disk and memory subsystems. For IBM 370. For IBM 360. For Univac 400 and 1100. For DEC System 10.

It will pay you to take full advantage of Ampex one-source shopping for all your peripherals needs.

Ampex, the biggest and best name in computer peripherals.

For details, call 800-421-6554, toll-free.



Visit Ampex at National Computer Conference Booth 2417

# AMPEX

AMPEX COMPUTER PRODUCTS DIVISION  
13031 West Jefferson Boulevard  
Marina del Rey, Ca. 90291 (213) 821-8933

# Governor Commends DP Crew for Flood Recovery

(Continued from Page 1)

"By his quick action, thousands of data storage tapes containing vital information were recovered and restored to a usable level. Only quick action on his

part could have saved the crucial information regarding the accounting system and the payroll and processing information for hundreds of state programs which utilize the central manage-

ment information system."

More than half of the approximately 30,000 square feet of space in the computer center was under 11 feet of water during the flood crest. During the flood,

the computer operations room containing a Univac 1108 computer system and all its ancillary equipment as well as 28 key-punch machines was completely destroyed.

"The tape file storage area which contained more than 18,000 reels of magnetic tape was the top priority," Ronald G. Lench, secretary of administration said.

"These tapes would have been lost, and we came very close to that, but for the dedication of the 123 persons in the bureau under Ippolito's direction," Lench said.

Ippolito had been on the job only four months when the crisis occurred but had sufficiently implemented several recommendations concerning possible contingencies such as fire or flood as recommended in the governor's

Review of Management Report.

Tapes were actually being removed during the period that the water was cresting. Those which could not be saved because of hazardous conditions in the building were washed with household detergent and dried with hairdryers.

During the two-week period after the flood the entire computer center was reinstalled in a nearby facility and operation was begun again.

"It is interesting to point out not a single paycheck nor pay-day was unmet during this hectic period," the governor said.

It has been estimated that the original tapes saved by the reclamation process saved \$250,000 in man-hours which would have been needed to reconstruct the tapes, assuming the raw data was available.

WITH  
STANDARD MEMORIES'  
SMART® 360 COMPATIBLE CORE  
YOU GET  
MORE CORE FOR YOUR MONEY  
IN A LOT LESS SPACE

Standard gives you more 360 core, in less space and at greater savings, than any other company. Our SMART system packs 256 kbytes in a desk-high cabinet just 23 inches square, and it's available for models 22, 30, 40 and 50.

Other features include bump store; modular design for field upgrades; CPU changeability; conversion of 2 usec model 30s to 1.5 usec; enhancement of model 30s to 256 kbytes and many more. For more information, fill in the coupon and mail it today!

I want to get the full story on how much I can save with your SMART® 360 core.

Name \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
Phone \_\_\_\_\_  
360 Model \_\_\_\_\_ Date core needed \_\_\_\_\_  
Capacity from \_\_\_\_\_ to \_\_\_\_\_ kbytes

STANDARD MEMORIES

INCORPORATED  
A Subsidiary of Applied Magnetics Corp.

2801 E. Oakland Park Blvd., Suite 307 • Ft. Lauderdale, Florida 33306 • Tel.: 305-566-7611  
TWX: 510-955-9828

## Prove Need Before Upgrade

(Continued from Page 1)

analysis of the installations' DP operations than GAO has performed before.

The problem with using any sort of economic justification for new equipment, he explained, is that almost anyone can list enough future applications to make the request seem reasonable. Even pointing to a system that is running around-the-clock on a current workload really avoids the issue, according to Chastain.

The central issue must be a determination of how well the current configuration is really being used "and that should be a consideration for any installation, not just the government ones that we ride herd on," he added.

Does a manager need new equipment if his present CPU is working less than 50% of the

time the system is being used?

he asked.

Chastain spoke at the two-day Scientific Computer Information Exchange Meeting sponsored by the Atomic Energy Commission.

## Study Reveals Welfare Errors

BOSTON — A study of the computerized state welfare recipient list has revealed errors in 650 cases. Payments to these people have since either been reduced or terminated and will result in a savings to the state of about \$57,000/mo, according to welfare commissioner Steven Minter.

The study revealed that about one percent of those receiving public assistance receive both welfare and unemployment compensation. A further check of the double recipients showed 361 cases or 26% are the result of fraud or misrepresentation. Payments in these cases have been reduced or terminated and are being referred to the Bureau of Welfare Auditing for investigation and prosecution.

In another 289 cases, or 21%, it was found that welfare payments were incorrect because of misunderstandings or delays in processing and these are being corrected.

In 41% of the cases checked, the double assistance payments were found to be legitimate. The remainder involved incorrect Social Security numbers or cases which have not been completed.

### Grant Aids Health Research

DENVER — Health Care Management Systems, Inc. has received a \$62,000 grant from the Robert Wood Johnson Foundation for research on computer applications in ambulatory health care services throughout the U.S.

The study is intended to identify which of the thousands of computer projects used in medicine could be of significant value; successful completion of this study should assist health agencies in choosing computer applications.

The project will involve a study of literature on existing computer systems followed by a study of representative systems.

## →THROUGHPUT←

### ARE YOU GETTING ALL YOU DESERVE?

THESE PRODUCTS FROM BOOTHE MANAGEMENT SYSTEMS CAN HELP YOU ANSWER THIS QUESTION  
WITH A POSITIVE

**"YES"**

#### SPOOLER

SPOOLER provides an economic printer output spooling routine for DOS installations. It allows the printing of output to be independent of the generation of the output. The technique employed by the SPOOLER is to write the output onto disk as it is being generated, then write from disk to printer as the printer becomes free — performing all of its functions in a partition as small as 4K.

#### BCCXREF

BCCXREF will reduce by over 50% CPU usage for the generation of the CROSS REFERENCE listing provided by ANS COBOL. BCCXREF will significantly reduce elapsed time in the compiler partition or region, increase throughput, and allow greater system usage for other purposes.

#### DOSRELO

DOSRELO provides a method of making DOS problem programs self-relocating. DOSRELO accomplishes the self-relocation capability for all programs, regardless of the language, by adding entry point logic to the object code of the program before the Linkage Editor catalogs it on the Core Image Library.

#### CIMS

The Computer Installation Management System (CIMS) provides a method to supply management with pertinent information in the utilization of their data processing hardware. CIMS accepts data collected by the System Management Facility (SMF), formats the data and presents the data in varying sequences and formats. Reports for job accounting, multiprogramming throughput, hardware analysis, and others are provided.

Immediately available for your free trial use with no obligation, of course.

→GET ALL YOU DESERVE!←

write or call

BOOTHE MANAGEMENT SYSTEMS

A DIVISION OF BOOTHE COMPUTER CORPORATION  
135 West 50th Street • New York, NY 10020 • Tel. 212/489-8710  
555 California St. • San Francisco, CA 94104 • Tel. 415/989-6580

Accepted by Banks,  
Aerospace, Oil, Universities,  
Accounting, and  
many other firms.

## Most Elections Officials Claim Systems Secure and Accurate

(Continued from Page 1)

According to the study, the average cost per registrant in counties using lever machine systems is \$1.39, compared to \$1.90 for the punched card systems and \$2.05 for the paper ballot counting systems.

The computer-based techniques were only less expensive than their manual counterparts in one application area—the maintenance of voter registration lists.

Counties that have computerized this function, the study found, spend 42 cents less per registered voter than their manual

## Safety Planning Unit To Analyze Data On Crimes in Schools

By Judy Kramer  
Of the CW Staff

NEW YORK—The Board of Education here has set up a unit in the Office of School Safety to collect and analyze data on crimes and acts of violence in the city's schools.

The new analysis and planning unit will use the Board of Education's IBM 370 computers to analyze reports on violent incidents in the schools to learn more about the types and severity of crimes committed, which schools or areas are more incident-prone, when these incidents are most likely to occur, and what types of people (boys, girls, gangs) are involved in the incidents.

Input for the system comes from formal written reports of accidents or incidents in the school which are sent to supervisory personnel and the school safety office. The local police also send in reports of crimes in or near schools.

Everything entered into the computer system is of a statistical nature, emphasized W. Domenique, systems analyst and head of the unit. No names of students or teachers are included and all written copies of original incident reports are destroyed at the end of each school year to protect the students, he said.

Data collected from this system will be used to determine trends and plan new efforts to protect students and teachers. The unit's reports will be used as a basis for training security personnel and for assigning day-to-day security guards.

counterparts. In all of the other application areas, the manual systems and computer systems cost approximately the same on a per registered voter basis, the survey reported.

Computer use in the elective process is still in its infancy, the report noted, pointing out that only 7% of the counties presently use punched card voting systems and an additional 2% use some sort of OCR system to help count votes.

At the same time, 16% of the counties use computer systems to maintain registration lists and 12.8% of the counties use computers to print summaries of election results. According to the report, 10.7% use computer systems "in some way" for ballot counting, since some of the counties using lever systems as the primary counting method, also use computers to some extent in the counting process. This is why this figure is higher than that for just punched card and OCR counties.

Only 9.7% of the counties use com-

## Accuracy of L.A. Vote System Challenged

By Marvin Smalheiser  
CW West Coast Bureau

LOS ANGELES—The accuracy of the computer punched card voting system here has been challenged by county supervisor Baxter Ward.

Ward asked the Los Angeles election commission for a "thorough review" of the system, which had a number of problems initially but which has been performing smoothly for the past two years.

Elected to the board of supervisors last fall, Ward expressed concern about the "security of the ballot" under the present system of punched card voting.

He said he wanted an extensive post-election manual recount to check against the computer count. There is now a manual recount of 20 precincts after each county election. The county has over 7,000 precincts.

Ward said he was curious about the

accuracy of the computer system because of a check of the votes he received in the primary election last year. In at least 34 instances, he said, identical vote totals were reported for successive precincts by the computer.

In some cases, he said, two precincts in a row reported an identical total for him or his opponent. In some cases three precincts in a row and in one case four in a row reported the same figures.

Ward told the election commission he took the matter to a private computer firm, which said a four-in-a-row sequence of identical totals was a "million to one" mathematical coincidence. The firm said it could not explain what it called an "interesting" situation.

A check of precinct totals for another election in 1970, Ward said, also showed the "unique" coincidence of identical figures in sequence.

puters to actually produce election results, the survey found.

Overall, the survey discovered the

punched card and OCR methods of election recording were most popular among larger counties.

## Did You Know?

One of a series MAKING IBM INSTALLATIONS WORK BETTER

### 50¢ of every DP \$ is spent on program maintenance.\* Reduce it with ADR Software.

\*EDP Analyzer, October 1972, That Maintenance "Iceberg," P.1. (Send for complimentary copy.)



Program maintenance has been described as an iceberg because the real costs are often hidden below the surface. And maintenance keeps costing since the average production program has a life span of 10 years or more. This means continual change. As machine requirements change. As operations change. As your computer programs, systems and programmers keep changing to keep pace with your company's growth and development.

Look to ADR's software products to significantly reduce the time and money you spend on program maintenance. Find out today how AUTOFLOW, The LIBRARIAN, and MetaCOBOL will improve the quality, reliability—and maintainability—of your programs throughout their productive life. Just send us the attached coupon, or contact any ADR office.

**APPLIED DATA RESEARCH** THE SOFTWARE BUILDERS®

ADR software products: in use at over 2,500 installations worldwide.

U.S. offices in Atlanta, Boston, Chicago, Cleveland, Detroit, Houston, Los Angeles, New York, Pittsburgh, Princeton, St. Louis, Washington, D.C., Representatives in Australia, Austria, Belgium, Brazil, Canada, Denmark, England, Finland, France, Germany, Italy, Japan, Netherlands, Norway, Puerto Rico, South Africa, Spain, Sweden, Switzerland, Taiwan, West Germany

APPLIED DATA RESEARCH, INC.  
SOFTWARE PRODUCTS DIVISION  
Route 208 Center, Princeton, New Jersey 08540  
Telephone: (609) 921-8550

Yes, I want to know more about ADR aids in program maintenance:

AUTOFLOW  The LIBRARIAN  MetaCOBOL

Name \_\_\_\_\_

Company \_\_\_\_\_ Title \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Telephone \_\_\_\_\_

Computer Configuration \_\_\_\_\_

I am also interested in:

EDP Analyzer article, October 1972

Other ADR software systems

PI SORT for faster sorting

SAM for planning

ROSCOE for on line program development

# NCC Sessions Offer Chance for User-Industry Dialogue

NEW YORK — The first National Computer Conference (NCC), less than a month away, looms as an extraordinary chance for users and industry figures alike to actively engage in dialogue and interaction.

In addition to the "conference

within a conference" approach, by which sessions are labeled either methods and applications or science and technology, there is a special program of in depth sessions, which gives attendees an unprecedented number and variety of sessions.

Advance registration for the June 4-8 NCC closes May 15. Prospective attendees should call the American Federation of Information Processing Societies, the conference sponsor, to obtain registration materials. Afips has a toll free number, 800-

631-7070. The conference fee is \$50 for Afips members and \$60 for non-members and includes a copy of the proceedings. A one-day pass to both the exhibits and the programs is \$20 while a five-day exhibit-only pass is \$15. Student

fee is \$5 from 210 Summit Ave., Montvale, N.J. 07645.

The following is a schedule of the sessions available at NCC. All locations are the New York Hilton except where specified at the Americana Hotel. Special sessions are in bold type.

## Monday

1:30-3:30

### Methods & Applications

1. Regulation of Computer/Communications Industry — *Robert Bigelow* — Sutton North

2. Voice Answerback Comes of Age — *Tom Fisher* — West Ballroom

3. Point-of-Sale Systems — *Richard K. Hampson* — Clinton Suite

4. Computer Use Around the World — *Bruce Gilchrist* — Nassau Suite

### Science & Technology

5. What's the Computation in Computational Linguistics? (ACL) — *Robert F. Barnes* — Georgian A, Americana

6. Conversion Problems — *Bonnie Dunning* — Murray Hill B

7. Design and Development of Application Packages for Users — *Wayne B. Nelson* — Georgian B, Americana

8. Computer Evolution and the Next Decade (IEEE Computer Society) — *Ned R. Kornfield* — Sutton South

9. Trends in Data Base Management — *George Dodd* — Regency Ballroom, Americana

3:45-5:45

### Methods & Applications

10. Legal Protection for Software — *Robert Bigelow* — Sutton North

Voice Answerback Comes of Age (contd.)

11. Data Processing Directions in the Retail Industry — *Richard K. Hampson* — Clinton Suite

### Science & Technology

12. Simulation: Past, Present & Future (SCI) — *Philip J. Kiviat* — Georgian A, Americana

13. Intelligent Terminals — *Ira Cott* — Murray Hill B

14. Computing for Statistical Purposes — Expectations Amid Accomplishments and Gaps (ASA) — *Mervin E. Muller* — Georgian B, Americana

15. Natural Language Processing — *Aravind K. Joshi* — Nassau Suite

Trends in Data Base Management (contd.)

16. Information Science and Technology from a Global Viewpoint — *Robert M. Landau* — Sutton South

## Tuesday

8:45-10:15

### Methods & Applications

17. 9-12, Performance Evaluation and Measurement — *Barry W. Boehm* — Sutton North

18. 9-12, Computers in the Elective Process — *E. Drake Lundell Jr.* — Sutton South

19. Publishing — *Frank Anzelmo* — Nassau Suite

### Science & Technology

20. Instrumentation, Computers and Process Control (ISA) — *Arthur C. Lumb* — Gramercy Suite

21. Advanced Hardware — *John T. Lynch* — Murray Hill Suite

22. Information Science — Promises, Realities and Futures — *Jack Belzer* — Gibson Suite

23. The Use of Computers in Education (AEDS) — *Sylvia Charp* — Clinton Suite

24. Environmental Quality and the Computer — *Peter W. House* — Georgian A, Americana

25. A Day of the Computer Arts Music: Demonstrations, Presentations, Philosophy — *Stefan Bauer-Mengelberg* — Regent Room

10:30-12:00

### Methods & Applications

Performance Evaluation and Measurement (contd.)

Computers in the Elective Process (contd.)

Publishing (contd.)

26. The Impact of Hand-Held Calculators — *Gregory Williams* — Beekman Room

### Science & Technology

Instrumentation, Computers and Process Control (contd.)

Advanced Hardware (contd.)

27. Specialized Information Processing (SLA) — *Betty B. Brociner* — Gibson Suite

The Use of Computers in Education (contd.)

28. A Day of the Computer Arts: The Editors View Computer Arts — *Grace Hertlein* — Regent Room

1:30-3:30

### Methods & Applications

29. Computers in the Congress — *Ernest C. Baynard* — West Ballroom

30. 1:15-3:45, Manufacturing Automation — *Robert H. Anderson* — Nassau Suite

31. Knowledge Dissemination — *Andrew A. Aines* — Gramercy Suite

### Science & Technology

32. Performance Evaluation — *Marshall D. Abrams* — Gibson Suite

33. Information Networks—International Communication Systems — *Betty B. Brociner* — Murray Hill Suite

34. An Undergraduate Program in Information Systems — *Gerald L. Engel* — Clinton Suite

35. The Impact of Networking on Storage, Retrieval and Transfer of Technical Information — *Andrew J. Kasarda* — Beekman Room

36. A Day of the Computer Arts: The Computer and the Arts — *George Arnovick* — Regent Room

37. Economic Future of the Data Processing Industry (Business Week) — *Lewis H. Young* — Sutton Ballroom

3:45-5:45

### Methods & Applications

38. Graphics Applications for the Garment Industry — *Fenton Gilbert* — Sutton South

### Science & Technology

39. The Auditor's Interface with EDP Systems (Aicpa) — *Noel Zakin* — Clinton Suite

Performance Evaluation (contd.)

40. Automated Project Management Systems — *Ira Bitz* — Murray Hill Suite

41. Academic Computing at the Junior/Community College: Programs and Problems — *Harold J. Highland* — Rhinelander Center

42. The Growing Potential of Mini/Small Systems — *Douglas B. McKay* — Beekman Room

43. Networks and Data Banks: What Contents? — *Michael Lesk* — Sutton North

44. A Day of the Computer Arts: The Renaissance of Art-Science — *Kurt Lauckner* — Regent Room

45. Computer Technology as a Public Resource — *Alan Kaplan* — Rhinelander South

46. 7 p.m., A Day of the Computer Arts: Computer Generated Films — *Kenneth Knowlton* — Regent Room

8:45-10:15

### Methods & Applications

47. Five Year Plans for Computers in State Government — *John Gentile* — Nassau Suite

48. 9-12, Computers in Automotive Design and Manufacturing — *Hans Kuschnerus* — Sutton North

### Science & Technology

49. Computer History: Critical Turning Points and Software Developments — *William F. Luebbert* — Gramercy Suite

50. Interactive Computing: A Mind Expander (SID) — *Carl Machover* — Murray Hill Suite

51. Resource Utilization in the Computing Community (ACM) — *Herbert S. Bright* — Georgian A, Americana

52. Data Security in Government — *James M. Clayton Jr.* — Sutton South

53. A Graduate Program in Computer Science — *Michel A. Melkanoff* — Beekman Room

54. Wave Form Analysis in Clinical Medicine — *Harold W. Shipton* — Regent Room

10:30-12:00

### Methods & Applications

55. Computer Operations of State Agencies and Universities — *John Gentile* — Nassau Suite

Computer Use in Automotive Manufacturing (contd.)

56. Wave Form Analysis in Clinical Medicine (contd.)

1:30-3:30

### Methods & Applications

58. Interim Report from the IBM Data Security Study Sites — *C.L. Foster* — Murray Hill Suite

59. Urban Services I — *Ed Blum* — Nassau Suite

60. Off Vehicle Diagnostics — *Joseph P. Sweeney* — Sutton North

61. Status and Future of Software Products Worldwide — *Martin Goetz* — Sutton South

62. 2:30-5:00, Graphic Applications II (contd.)

63. Views of the Future I — *Murray Turoff* — Gramercy Suite

64. Mathematical Software: State-of-the-Art (Siam) — *William Jameson Jr.* — Regency Room

65. Computing and the Law: Interactions — *Philip H. Dorn* — Regent Room

3:45-5:45

### Methods & Applications

Urban Services II (contd.)

66. Development of Generalized Software Products — *James Porter* — Sutton South

631-7070.

The conference fee is \$50 for Afips members and \$60 for non-members and includes a copy of the proceedings. A one-day pass to both the exhibits and the programs is \$20 while a five-day exhibit-only pass is \$15. Student

### Science & Technology

89. Network Computers: Economic Considerations — Problems and Solution — *William J. Barr* — Gramercy Suite

90. Applications of Automatic Pattern Recognition — *Louis S. Rotolo* — Regency Ballroom, Americana

Managing the Impact of Generalized Data Bases (contd.)

3:45-5:45

### Methods & Applications

91. 3:15-5:45, Inhouse Training IV — *Dorothy Tucker* — Sutton South

92. 4:15-6:00, Security and Privacy in Disaster — *Thomas B. Steel Jr.* — West Ballroom

Computers Are for People (contd.)

93. Metrification — *W.E. Andrus*, Jr. — Versailles Terrace, Americana

### Science & Technology

94. Nontechnical Causes of Failure of EDP/MIS Groups — *Herbert Halbrecht* — Trianon Ballroom

95. Cryptology in the Age of Automation — *Henry Ephron* — Royal B, Americana

Network Computers: Economic Considerations — Problems and Solution (contd.)

96. Ingredients of Pattern Recognition — *Robert S. Ledley* — Regency Ballroom, Americana

Managing the Impact of Generalized Data Bases (contd.)

7 p.m. Managing the Impact of Generalized Data Bases (contd.)

## Friday

8:45-10:15

### Methods & Applications

97. Economics and Remote Terminals — *Dan Printz* — Royal B, Americana

98. Virtual Machines — *Ugo O. Gagliardi* — Sutton North

99. What's Different About Tactical Military Computer Systems — *James A. Ward* — Royal A, Americana

100. Associative Processors — *P. Bruce Berra* — Madison Suite

101. Computer-based Integrated Design Systems — *Herbert M. Ernst* — Princess, Americana

102. Discrete Algorithms, Application and Measurement — *Michael L. Krieger* — Sutton South

103. Career Development for Computer Professionals — *Paul Oyer* — Versailles Terrace, Americana

Managing the Impact of Generalized Data Bases (contd.)

10:30-12:00

### Methods & Applications

Economics and Remote Terminals (contd.)

### Science & Technology

Virtual Machines (contd.)

What's Different About Tactical Military Computer Systems (contd.)

Associative Processors (contd.)

Computer-based Integrated Design Systems (contd.)

Discrete Algorithms, Application and Measurement (contd.)

Managing the Impact of Generalized Data Bases (contd.)

## 'Special Regulations' for Each Country

# World Group Urges Right of Inspection of Data Banks

By E. Drake Lundell Jr.

Of the CW Staff

PARIS — All private data banks containing personal information should be regulated just as credit data banks are in the U.S., and governments should consider allowing citizens to see government information kept on them in public data banks, according to a "restricted" report prepared by a subcommittee of the Organization for Economic Cooperation and Development (OECD).

The report, submitted to the OECD's Computer Utilization Group, noted that "central governments are faced with the problem of engendering public alienation over the personal and societal implications of the computer," particularly in the area of personal privacy.

Because of this, the report recommended, "public uncertainties regarding data confidentiality and security should be resolved as quickly as can be achieved in each country."

To help overcome this public fear, the report stated, "special attention should be given to the question of the individual's access to public and private files containing personal information on him."

In addition, the report recommended that "the use of data from private data bases, such as credit reference, medical, insurance and business personnel records, ought to be subjected to special regulations."

The report also indicated that governments should launch "formal programs" to "apprise the public of the characteristics of computers, their use by government, immediate and future benefits."

In addition, the report noted that for some fast-changing files it would be hard to provide an up-to-date printout to people identified in it.

However, the report found that a more workable solution might be to allow persons to inspect their files where they were being kept, much as the Fair Credit Reporting Act does in the U.S.

But, it noted, at present it would be hard for all government agencies that kept records on individuals to meet "the demand of curious constituents if this were a public policy."

"Perhaps later, when the personal identifier becomes a key to release file information at the local post office terminal, such an access right can be contemplated."

### Computer May Hold Key To Ancient Mayan Glyphs

UNIVERSITY OF MEXICO — The hieroglyphic writing of the ancient Maya Indians, which has puzzled scholars for centuries, is now beginning to yield its secrets thanks to some modern decipherment techniques.

One method being used by a group of scholars at the Center for Maya Studies at the University of Mexico combines the computer and linguistics.

The scholars are compiling a computer catalog of pottery glyphs and two of the three existing Maya books (codices) now preserved in museums in Dresden and Madrid.

By assigning numbers and letters to represent the different parts of glyph "sentences," they hope to construct a computer "map" of the books. The glyphs are normally arranged in "cartouches," four- to six-character sentences. Thus a cartouche might be represented in a printout as DO4W - E45E - J82P - M08U.

When this task is completed, it should be possible to compare different parts and spot frequently used constructions.

The computer project, coupled with the current independent project of a linguist who is trying to recreate the ancient Mayan as spoken when the codices were written, will hopefully provide the key to the written language.

plated."

As a compromise to releasing a person's complete file or letting him inspect that file, the report suggested allowing individuals to "challenge and rebut derogatory information in personal files in government departments and agencies."

To do this the governments would have to inform an individual that a certain file was the source of information that prevented him from getting some benefit and then allow him to see that file and delete or correct any inaccurate information, the report said.

Including this right of inspection whenever information in a file is used to deny a citizen something should go a long way toward allaying the public fears about the retention of records in computerized data banks, the report added.

The report noted that today "there is wide agreement on the desirability for installing computers for recordkeeping

and more sophisticated tasks in public administration" among the 14 member countries that make up the OECD.

However, it stated that "the issues before central governments are changing from a commitment to install automatic data processing to the best practice governing its use" once installed.

#### Security Downplayed

While consideration is being given to some other areas of computer operation, the report noted "the installation of security techniques in a data base containing health, economic, welfare, census, housing, political or other categories of data which include personal identifiers is not being actively considered by any country, as far as could be determined."

Rather, the report said, "rules of prudent administrative management information collected by central governments on their citizens are considered sufficient

protection of data integrity" in the countries surveyed.

But the report indicated that "there seems to be a need to examine higher levels of data confidentiality for traditionally routine files."

Even though the report found a need for more protection for personal files, it said that "the notion that every citizen has a right to computer printout of all (non-security) records held by central government was found to require further investigation to determine its feasibility."

The cost and complexity of providing every citizen with a printout of his files, the report indicated, "would probably bring to fruition a centralized intelligence data base employing standard personal identifiers, an effect generally opposed by those supporting the notion of a right to printout."

## SkyCab GUARANTEES YOUR PACKAGE DOOR-TO-DOOR:

New York-Chicago, 6 HRS; Chicago-Los Angeles, 8 HRS;  
Los Angeles-New York, 10 HRS...

Ship computer cards, parts or tapes, contracts, prospecti, SEC and regulatory filings—practically anything, anywhere today!

SkyCab is ready to deliver your package to and from anyone, anywhere in over 18,000 U.S. cities and towns today. Each SkyCab trip is a special express just for you—there's no faster way to get a package from one place to another, unless you take it

yourself (even then, SkyCab might win). One call to our toll-free number does it all.

SkyCab is a unique marriage of a nationwide fleet of high-speed taxis with the fully-computerized facilities of one of the world's largest air freight systems.

Call now—  
SkyCab is ready.

**skycab**  
A SERVICE OF  
SHULMAN AIR FREIGHT



1 One toll-free call brings your SkyCab agent to your door. He'll take your package directly to a flight already assigned by SkyCab's computerized control.

2

3 Delivery to your addressee's hands within specified time limits is guaranteed, or you get half your money back. (Maximum package limits: 90 inches aggregate dimensions and 50 pounds.)

**ONE CALL DOES IT ALL. 800-257-7888**

In New Jersey, call 800-322-8600. In Alaska and Hawaii, call collect 809-424-5353.

© 1973 by Shulman Air Freight, Inc.

## L.A. County to Monitor Justice Systems

CW West Coast Bureau

LOS ANGELES — The district attorney of Los Angeles County is planning to set up a management information system which would monitor the performance of the county's criminal justice system from police to prosecutors to judges.

Promis (Prosecutors' Management Information System) is expected to be on-line in about three years at a cost of \$1,079,484, partially funded by the Federal Government.

It is intended to give visibility to and standardize procedures in the criminal justice system to insure equal and consistent justice in various parts of the country.

Robert Martin, special assistant district attorney, said the system would be implemented in two 18-month phases.

One will be for software cleanup and the second for selecting and automating those portions of the district attorney's functions most susceptible to data processing.

The software will be developed by a joint project team of top executives and deputies and an outside consultant not yet selected.

### Decimal Point Error Delights Shareholders

NEW YORK — The dividend checks read 75 cents per share and 32,000 shareholders of Dart Industries, Inc., of Los Angeles, were celebrating the unexpected increase of almost 70 cents per share.

The celebration was soon cancelled, however, as were the checks which had been mailed out by Morgan Guarantee Trust Co., dividend-disbursing agent for Dart Industries.

New checks will soon be received by shareholders, but with a small alteration — the decimal point has been shifted. Corrected statements will read 7-1/2 cents per share, which is what the originals would have read if a programmer hadn't input wrong data, according to Russ Everett, spokesman for the bank.

"It was strictly a human error, not connected with the computer in any way," Everett said. This human error nearly cost \$13.5 million.

### DP Does It Again

HOLLYWOOD, Fla. — They've done it again — computers have helped police track down a stolen car, but this time it was a double coup.

After Bernie Seville allegedly took a 1965 model car from a garage on approval and never

returned the vehicle, Newcomerstown, Ohio, police input the information into the national crime information file.

According to Florida police, Seville managed to obtain a title and Ohio license plates for the car and drove it to Hollywood,

### News Wrapup

where it was stolen when he parked it on the street.

Seville reported the theft to the Hollywood police who fed the information into their computer. The computer indicated that Seville himself was sus-

pected of originally having stolen the car. He was then apprehended and held for the trial.

### Harlem Center Opens

NEW YORK — A new community-oriented DP center has opened in Harlem which will serve black businessmen, train black computer operators and keypunch operators and funnel profits into a fight against some of the community's "many ills," according to Heyward B. Davenport, chairman of the board of directors.

Har Computer, Inc. expects to reap \$250,000 in profits by next April, Davenport said.

## Firm Fermenting Fake Food

LEHIGH VALLEY, Pa. — One-celled organisms are teaming up with computers to produce a myriad of life's essentials through Fermentation Design, Inc., whose products include antibiotics for medical purposes and enzymes for laboratory studies and industrial applications.

Fermentation Design's business is to design and manufacture complex research systems for other companies engaged in production fermentation, the manipulation of large colonies of single-cell organisms to produce marketable quantities of organic products.

A computer simultaneously monitors and manipulates cultivated organisms' environments to find a combination of factors that will maximize the microbes' productivity.

One Fermentation Design Project is the biosynthesis of protein for food value — the manufacture of "synthetic food."

Biosynthetic protein can be added to processed foods as a filler or spun in much the same way sugar crystals are spun to make cotton candy. Spun protein can be formed into shapes and textures that people recognize as real food.

now... Total Data Entry

A single system that handles all input requirements!



**NUMERIC KEYBOARD  
INEXPENSIVE ADDITION  
TO ANY TELETYPEWRITER  
TERMINAL**



- ANK-16T for ASR-33, ASR-38 \$149.50
- ANK-16U for UNIVAC DCT 500 \$150.00
- ANK-16E for TI 700 SERIES, \$175.00

TERMINET 300, DI/AN 9030, etc.  
- RS 232 TRANSPARENT INTERFACE -

COMPLETE INSTRUCTIONS AND  
WIRING HARNESS INCLUDED.  
ALSO AVAILABLE FOR RENT.

TTS 2928 Nebraska Avenue  
Santa Monica, California  
90404 (213) 829-2611

Recognition Equipment is in: Austria, Belgium, Canada, Denmark, Finland, France, Italy, Japan, Netherlands, Norway, Sweden, Switzerland, United Kingdom, and West Germany.

# Church Seeks Disclosure of IBM S. African Dealings

By E. Drake Lundell Jr.

Of the CW Staff

NEW YORK — Charging IBM with breach of promise, the Episcopal Church has renewed its efforts to get the firm to disclose information about its dealings in South Africa.

The church, which owns over 8,000 shares of IBM stock (worth more than \$3 million), has even filed a stockholder resolution that was included in the IBM proxy statement, asking the firm to provide "basic data" about its South African operations and employment practices so that stockholders might give

those practices "thoughtful consideration."

Discussion of this proposal dominated the annual meeting of about 1,200 shareholders last week before it was defeated.

Frank T. Cary, president and chairman told the shareholders he felt IBM could do more good by staying and working in that country.

At the same time the church's Committee on Social Responsibility in Investments filed the resolution, Paul Neuhauser, committee chairman, charged that IBM had not lived up to its promises to supply similar information last year.

He also said that IBM had agreed to provide information in separate categories in response to last year's stockholder resolution, but it had been withdrawn prior to the annual meeting when the committee and IBM agreed on a draft report that was to be presented at the meeting.

However, Neuhauser now charges that the company "omitted much of the factual material" which IBM had promised to supply. In fact, he said, 80% of the material in the draft report was omitted from the report of the annual meeting.

The IBM board of directors has urged the shareholders to vote against the proposal.

The Episcopal Church is a member of a six-church consortium called "The Church Project on U.S. Investments in Southern Africa — 1973," which is challenging some of the largest U.S. corporations about their investments in South Africa.

While the churches were stepping up their campaign against IBM and charging it with deceit in its agreement last year, they at the same time cleared another computer company, Burroughs Corp., from a proxy battle, because Burroughs voluntarily agreed to publish a report of its activities in South Africa and on other social issues.

## Investment Details

The resolution filed with IBM asks for information on the annual capital investment in South Africa since 1962; the annual profits; the number of employees by race; contractual relations with the government there; and taxes paid to the South African government.

It also seeks "a listing and explanation" of grants and charitable gifts made there by the company since 1962.

In the area of relations with workers, the resolution asks the firm to supply a listing of current wages and employee benefits by functional job description comparing workers of different races and a summary of such wages and benefits and promotions for whites and non-whites since 1962.

It also seeks a listing of grievance procedures open to African workers and questions whether the firm has any trade union contracts that restrict the opportunities for Africans.

Furthermore, the resolution seeks a description, by race, of "technical training, general education, legal assistance, housing or other programs provided by the corporation for workers or their families."

It also asks for a description of the firm's investment plans for the border areas of the Bantustans and a description of the total number of non-South African personnel employed in the country and the international recruiting programs of the firm.

Finally it requests that the firm describe and explain "those South African laws which directly affect the corporation's employment practices and the working conditions" of African workers and a statement on compliance with those laws and on what action the firm has taken to get them changed.

The church also seeks a list of products sold for military and police use to the South African Government since 1962.

## SHARE DATA NETWORK

Nationwide private line full duplex network serving 42 cities in 25 states. AVAILABLE for dedicated use between 7 P.M. and 7 A.M. E.S.T., 24 hours for multiprocessing, or utilization of unused bandwidth. Network available in whole or in part.

Please reply to Box # 3850  
60 Austin Street  
Newton, Mass. 02160



## Editorials

### A Clean Slate

IBM should supply the Episcopal Church with information on its operations within South Africa.

It is hard to understand why the IBM Board of Directors is fighting this request — Burroughs and Mobil Oil have proved that firms can comply with the proposals adequately without bankrupting themselves.

Surely with IBM's resources, the answers to the questions asked by the church are probably already available somewhere.

Last year IBM released partial information on its activities in South Africa which made the firm look very good in its employment and training practices for Africans. Surely the release of similar information this year would also reflect favorably upon IBM.

### Breaking the Silence

The relationship between a DP user and his vendor is not a private domain that must be protected at all costs. While some vendors would have this relationship protected in much the same way a patient shares confidences with his doctor, most users object.

The myth that secret negotiations between user and vendor lead to favored treatment and discounted prices for the customer cannot be verified. And subservience to the whims of the vendor should not be required for proper treatment for the user.

Fortunately, most users enjoy a reasonable relationship with their vendors and their DP systems meet many, if not all, of their expectations.

So it is unbelievable that some users believe they must suffer in silence, lest they incur the wrath of their local salesman and his superiors.



## 10 Guides Can Help Manage System Design

These ten "commandments" should help manage the design of our information systems (see Siemens et al, *Operations Research*, N.Y., The Free Press, 1973):

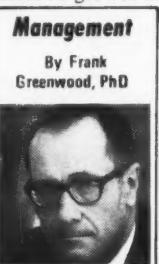
**1. Systems have a triple function: to get action, to record that action and to report the results.**

When an organization grows beyond a one-man operation, efficiency suggests specialization of labor. As continued growth is matched by spreading specialization, someone must begin concentrating on coordinating the activities of these specialists.

Organizations thus consist of specialized parts which are coordinated by management. Information binds these split parts. The information system gears individual contributions to the overall plan and coordinates the specialists.

Probably 90% of the transactions in most organizations are concerned with routine actions.

System design develops decisions determining: the best way to handle these routine transactions, who does what, the forms needed and the policies and procedures governing the effort. If 90% of the transactions pass through this type of systems channel, it is fast and cheap, leaving only 10% to be handled as nonroutine exceptions.



**Management**  
By Frank Greenwood, PhD

#### 2. Systems are natural cycles.

Find the pattern of 90% or so of the transactions. Identify the major objective of this bulk activity, where it starts, where it ends and the process points between. This defines the system to work on. Ignore department boundaries because they seldom coincide with system parameters.

#### 3. Emphasize the work objective.

Define what results from the pattern of activity which makes up the system cycle. This limited work result needs to be related to the other goals of the organization, coordinating the overall effort.

#### 4. Systems improve coordination.

Systems help coordinate by gearing individual effort to overall objectives. This requires careful analysis of how the work should be done, including: people's skills, procedures, data, machines, forms and policies. Information systems help achieve coordinated effort by getting action, by recording that action and by reporting the results.

#### 5. People make a system work.

Operating (often clerical) people can make a poor system work or a good system fail. Therefore, involve these individuals in the system design early. Listen to them. Give them credit for their contributions. Keep them informed.

#### 6. Forms and procedures are important.

Forms carry the data in the system and should be designed with this basic role in mind. Procedures are equally essential, helping to coordinate by defining

who does what and when.

#### 7. Minimize data handling.

Handling data is expensive, so avoid it. Eliminate recopying the same data, which is both costly and error-prone. Give each work station only the data to do its work (often reporting by exception).

Give particular attention to the connections between people working; that is, watch the transfer points, establishing where the responsibility of one person ends and where that of another begins.

#### 8. Get machine-readable data early.

Record the data at the point of origin in machine-readable form. Capture enough data at this point to serve all the subsequent data needs of the system. Process the data mechanically from then on.

One way to design a system is to begin by defining the specific output reports, and then to work backwards to identify the inputs needed for that output. This approach is alright until promotion, transfer or retirement brings in a different executive to head up the office for which these output reports are designed.

The new fellow will probably need different reports, since his style of management is different. Much of the system now must be redesigned and reprogrammed to pick up the new input needed for his new output reports.

Therefore, a better way to begin the system design is to start by defining the data base (instead of just some specific output reports). That is, determine what data is needed now and

to give additional support to RPG II under DOS. Specifically, I am referring to:

- Compatibility with CICS/DOS. As you know, only COBOL, PL/I and assembler are supported.
- Compatibility with a Data Base Management System (VANDL/I or DL/I).
- Ability to OPEN and

CLOSE files in the calculation specifications.

• Ability to define an Isam file for sequential processing and also be able to chain to the same file without having to redefine it as a chain file.

- Ability to read an Isam file with a partial key.
- Relative addressing of positions within a field or record.
- More indicators.
- Ability to use registers in the calculation specifications.
- Ability to update a sequential file at total time.

• A cross reference list at the end of a compilation showing each field and every statement it is used with.

RPG II has proven to be one of the most productive commercial languages now available on the market. It is significantly superior to Cobol both economically and productively.

I would need five Cobol programmers to do the work of three RPG II programmers. (See related story on page 15.)

The greatest and most important enhancements that IBM could make to RPG II are CICS and Data Base Management support. We use RPG II for all of our batch systems and CICS/DOS for our on-line systems.

The enhancement mentioned above would only be used a small amount of time, but would be very helpful when needed. Such enhancements would make RPG II a much more powerful language.

Managers are interested in productivity and from this standpoint, RPG II can't be beat. If IBM would only give it the additional support it needs, IBM would make a major contribution to the efficient and economical use of computers.

Mike Pauken

Director, Data Processing  
St. Vincent Hospital and  
Medical Center  
Toledo, Ohio

Computerworld welcomes comments from its readers. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

(other letters and viewpoints on Pages 12 and 13)

© Copyright 1973 by the Free Press. Reprinted with permission of The Free Press from Operations Research, Planning, Operation and Information Systems, by Nicolai Siemens, C.H. Marting and Frank Greenwood.



**Must Start From Within****CDP Needs Positive Help, Not Prophets of Doom**

By Kenniston W. Lord Jr.

Special to Computerworld

If one were to take the perspective of some recent prophets of gloom, one might come to the conclusion that the CDP program, and all it has attempted to be, has gasped its final breath.

Nobody denies that the CDP program has not been "everything it has been cracked up to be." It is for that precise reason that groups of CDP holders have attempted to organize over the years.

The parent of this "teenager," while continuing to administer the test, has done little to promote the value of the certificate and the person who holds it. No attempt has been made, since its inception:

- To answer the question, "What shall he certify?"

- To convince corporate management anywhere that this was a worthwhile individual to hire.

- To reach the attorneys general of the several states to seek a legal status for this individual.

- To produce a code of ethics with teeth in it, with an evaluative measurement, or with enforcement procedures.

- To organize these "children" into a national force to bring strength to the profession.

The entire industry has stood by and let the function be labeled as non-professional. There is no loyalty where there is no strength.

The basis for these people to function is standards. To my knowledge, the parent in this case is not a working member of any standards activity. In truth, the parent is unable to certify to American industry that the recipient of this certificate has accomplished anything short of the accumulation of certain amounts of education, certain lengths of experience and the ability to answer eight hours worth of multiple-choice questions.

How many more headlines like "The Great Fraud: DP or Not DP?" will be required before the attorneys general start raising holy hanna with the data processing practitioner? How many more documented cases will be required before business and industry rises en masse to demand the same quality service from their data processing professionals that they do of any other licensed or certified

**Letters to the Editor****Are Old-Timers Afraid Of Young, Bright DPers?**

I take exception to the remarks made by Joseph T. Rigo in the April 25 issue.

There seems to be a kind of masochistic syndrome that is being fostered within the data processing field. There seems to be some kind of delight in tearing down, tearing apart, nit-picking at every thread and fiber until the whole fabric of this highly technical and professional activity is in tatters and is subject to general ridicule, contempt and suspicion.

Are these negative people afraid that there are just too many new, brighter and more knowledgeable people entering the data processing field? Are they afraid that their prestige is in jeopardy? The reaction is not unusual. It has happened many times in history as the old-timers are threatened by the new-timers.

Let us be a great deal more realistic and practical and positive in our opinions about the data processing field. If you do not like the climate of the data processing field, seek another avocation.

Robert R. Hamilton  
Manager  
Electronic Systems  
and Methods Division

Prudential Insurance Co.  
Boston, Mass.

group of individuals?

We license a variety of professions and para-professions not merely as a source of revenue, but as a guarantee to the user of that service that the individual is competent to perform that service, with the

**Viewpoint**

right to the recovery of damages if he is not. Why should it be any different for the data processing individual merely because he is buried in the folds of a corporate empire?

How many more credit card fiascos will the public stand for? How much more abuse of corporate power, power obtained by blaming the computer, can we stand?

Not everyone who holds the CDP could be called a professional, just as not every professional, in the true sense of the

word, is a CDP. But it has to start somewhere. And it has to start with us. If it begins at the urging of non-DP people with legal leverage, we no doubt will be very unhappy with the results.

There are a whole cadre of people who need to be certified — not with just one test, but it is becoming very obvious that they must be certified by many and varied measurements. The new parent, the Computer Foundation, must give the program and whatever other programs it assimilates or develops, the teeth and tenacity it will demand.

Legal stabilization must be sought. Diverse measurement must be developed. Upgrade training must be developed and implemented, with or without recertification. A campaign of education and information must be undertaken throughout the country to both gain industry acceptance of the individual, and to insure that the individual performs as required.

New tests must be developed, preferably by individuals whose business is tests and measurements. A system of state codes must be developed and licensing obtained, if not for all data processing individuals, then certainly key data processing personnel and those who interface with the public. A decent code of ethics with an appropriate enforcement mechanism must be developed, subscribed to and implemented.

This is the mandate to those of us who are determined to keep the CDP program alive. It would be useful if its detractors would spend their time in assisting us to build in a positive direction, rather than seeking to destroy what the program's parents, however ineffectively they may have executed the plan, have built.

*Kenniston W. Lord is an EDP educational consultant and vice-president of the Society of Certified Data Processors.*

**NCR CENTURY COMPUTERS PROVIDE MORE RESULTS!**

Every day more and more NCR Century computers are serving more firms everywhere. The computer users shown here represent today's progressive management so what they say about their systems can be important to you.

You'll learn these NCR customers have one thing in common: their NCR Century systems are providing them with the information they need to successfully manage their businesses.

Whatever your business, there's an NCR Century System that will provide better results and more benefits for your operation, too.

For complete information on the NCR Century system that's right for your business, call your local NCR man. Or write NCR, Dayton, Ohio 45479.



**"We have to know what we produced on the night shift by seven the next morning. That's what our NCR Century gives us, in time, every time."**

Frank Loria, Corporate EDP Manager  
SOS Consolidated, Inc.  
Birmingham, Michigan



**"We needed a central information file to remain competitive. The NCR Century had it. And NCR knew how to make it work."**

Ken Walker, Executive V.P. and Cashier  
1st National Bank of Lake Forest  
Lake Forest, Illinois



**"Our NCR Century computer gives our job shop the most complete production control system I've ever seen in any shop!"**

Charles Phillips, Vice President  
Lockwood Manufacturing Company  
Cincinnati, Ohio



**"Our quarterly reports used to take two full days. Now they're out in three hours. The difference? Our NCR Century."**

Bob Schrader, President  
Evanston Federal Savings & Loan  
Evanston, Illinois



**"The best thing about our NCR Century? The way it eliminates guesswork. I get the receivables and sales information I need to make decisions . . . the right ones."**

Larry Davidson, Vice President  
Davidson and Leventhal  
New Britain, Connecticut



**"When we decided to computerize we knew we had to pick one company and stick with them. We chose NCR."**

David D. Hart, Vice President  
Maryland State Savings & Loan Association  
Hyattsville, Maryland



**"Keeping customers waiting means bad press for any savings and loan. It's a problem our NCR Century eliminated. Twice."**

Dick Pokorny, General Manager  
Financial Computer Services  
Cleveland, Ohio



**"We have greater financial control over municipal services than ever before. And the reason is our NCR Century."**

Thomas G. Zeidell, Management Systems Administrator  
City of Pontiac, Pontiac, Michigan

**NCR**  
Computers & Terminals

# Does RPG Help Produce a 'Professional Product'?

By Reginald D. Gates

Special to Computerworld

I've been interested in the recent exchange of letters regarding RPG. Although I was originally trained in assembly language and my current assignment is Ansi Cobol, I've had experience with System/3 RPG, DOS RPG and OS RPG. In the past year I've been involved with a project that converted over 50 System/3 RPG programs to run under RPG on the IBM 370.

I quite agree with the viewpoint that languages are simply tools to perform a task. Even though we select our tools according to the task's requirements, this does not prevent us from evaluating the tools. The basic question is, "Does the chosen tool help us in producing a professional product?"

A professional program has at least the following characteristics. The program can be run by an operations group without the programmers' intervention; the program can be easily understood, debugged and modified by someone other

than the original programmer. RPG does not lend itself to producing a professional program as judged by the above criteria.

The Achilles heel of most RPG applications seems to be the second criterion. A few reasons why RPG does not seem to be adaptable to professional programs are:

## Viewpoint

- The language itself is more difficult to understand than the near-English language of Cobol.
- It is extremely difficult to produce an intelligible flowchart of an RPG program (at least, I've never seen one).
- There are no execution time debugging facilities such as the "Display" verb or IBM's "Ready Trace."
- All the RPG halts possible are not documented, especially the ones dealing with chained files.
- In RPG, it is not possible to work

backward from an interrupt and a core dump to the source code that produced the interrupt.

• There is no convenient method for stating the meaning of each indicator used in the RPG program.

• RPG does not lend itself to modular programming, i.e., coding and testing a program in logically related sections.

Finally, a word about "productivity." The obstacles to producing professional programs in RPG can be overcome by expending quite a bit of effort in the area of documentation. However, most programmers and their managers seem to feel that documentation is not "productive" work, and will bypass the documentation for more interesting tasks.

An RPG programmer can produce a working program in less coding time than a programmer using Cobol, but the RPG program will be lacking the necessary documentation. It will take more effort to properly document the RPG program so that the productivity gained by RPG in coding will be lost in documentation.

Of course, if a professional product is desired, the documentation for RPG can be minimized, and the programming staff can appear to be very productive.

Whatever language is used, products of a professional nature should be the objective of every programming staff.

Reginald D. Gates is employed by McDonnell Douglas Automation Co., Huntington Beach, Calif.

## Letters to the Editor

### Certify People First

Alan Taylor, you're on the wrong road!

In the April 4 issue you support Jerry Martin's idea for certified documentation and certified testing as the second great step forward for mankind, while giving next to no consideration to this vital question: "Who's going to do the certifying?"

I recall seeing only four words in the entire article which addressed this question: "... who should give them, ..." — although that has been, and probably will continue to be, the key question. Now, I'm asking you: Who's going to certify that the certifier is qualified to certify? And, how?

I don't disagree that documentation and testing certification are good ideas, but most organizations heavy in EDP already have the people to do this job — their own internal auditing departments!

Maybe it should become an industry standard, but as such, it would still be an auditing function.

At least the idea might be capitalized as a marketable service to users. But here again, I would caution those users to question the certifiers' qualifications!

In addition, your assertion that "we did have a number of people picked out ... who could be called 'professionals'" is without merit. You, of all people, should not have to be reminded that the mere fact of membership or officehip in some computer society or the holding of a certificate is no claim to professional status.

Professionalism is gained by adherence to a rigid set of ethical standards, be they written or implied, and by the acquisition of public confidence.

Certainly, we do have some true professionals by the above definition, but we haven't been able as yet to give them the identity and recognition they deserve, which is my point. We still have the task of people certification before us. Let the applications documentation take a back seat to this!

D. R. Lister, CDP  
Standards Specialist

Spring Mills, Inc.  
Lancaster, S.C.

I said that various groups "could" be defined as professionals — not that they should be. See, for example, the ACM New York Ombudsman's definition, "In my book, a professional is someone who gets paid for his work." [CW, April 25, An Obituary on the Fated DP Certification Program]. AT

### RPG Does It for 360/20

I must stand and be counted in defense of RPG. The several comments on its being a "Mickey Mouse" language and the creator of "operational nightmares" are not necessarily so. Properly understood and used, it can and does do many things for the smaller DP user.

Perhaps my people are even better than I thought, because we have no such problems as have been described in recent letters. I'm not recommending it for a larger-scale system but for our 360/20 it does it all.

A. Donald Taylor  
DP Manager

Robert Packer Hospital  
Sayre, Pa.

**"Our NCR Century gives us so many capabilities it's like having two computers for the price of one!"**

Sam Muldres, President  
Western Massachusetts Computer Center  
Holyoke, Massachusetts

**"Benchmark tests proved the NCR Century could handle our inventory requirements faster and for less cost than other computer systems."**

James L. Meagher, President  
Stratton & Terstegge, Inc.  
Louisville, Kentucky

**"Now we measure every activity by its contribution to profit. Key to our success is the NCR Century computer system."**

C. J. Sumner, Manager of Data Processing  
Continental Steel Corp., Kokomo, Indiana

**"With the NCR Century computer, off-the-shelf software is economical and practical, and conversion is quick. Our return on investment began in less than a month."**

Harold Canada, Vice President  
Hafer's, Inc., Salt Lake City, Utah

**"Our NCR Century computer prints prices and invoices for same-day shipment. That's great customer service. And we've increased turnover with less staff and inventory."**

Robert R. Buchanan, President  
Northwestern Drug Co., Minneapolis, Minn.

**"I was impressed most by the add-on features of the NCR Century, since we are looking for a 100% growth factor in the next 5 to 10 years."**

Max Disbennett, Comptroller  
University of Tampa, Tampa, Florida

**"Our NCR Century Computer helped us increase our annual sales \$5,000,000 and decrease our inventory \$170,000."**

John Caputo, President  
Garden Fresh Markets, Clarksburg, W. Va.

**"The fact that the NCR Century 100 computer system could grow along with my retail operation sold me on NCR."**

Yale T. Dolginow, Exec. Vice President  
Dolgin's, Inc., No. Kansas City, Missouri

**"We compared the main manufacturers of computers and picked NCR primarily because of our past experience with the service they've given us on other equipment in our bank."**

Wendell H. Conaway, V.P. of Data Processing  
Commercial Bank at Daytona Beach  
Daytona Beach, Florida

**"Town government and citizens of every community are demanding far more accountability from the people who run the schools. Our NCR Century enables us to meet this demand."**

Paul R. McDevitt, School Business Administrator  
Darien Board of Education, Darien, Connecticut

**"To match our NCR Century's performance with another computer system would have cost us twice as much."**

Roy J. Bernard, Director of the Computing Center  
Southeastern Louisiana University

**"We chose the NCR Century because the product for the price was better than anyone else had to offer."**

Dan Seyfarth, Data Processing Manager  
McHenry Hospital, McHenry, Illinois

**"Our NCR Century System has meant new life for this office. Our patient accounts are now always current, accurate and under control."**

R. B. Watson, Comptroller/Treasurer  
St. Joseph's Hospital, Asheville, North Carolina

**"The greatest advantage from our NCR Century system? I'd say customer service. We can respond to our customers' needs much better than we could before."**

Walter F. Urban, Jr., Treasurer  
Union Federal Savings & Loan, Pittsfield, Mass.

**"With our NCR Century C.I.F. System all data on each customer is in one place for account analysis and creative marketing. Our growth depends on this."**

Bert Lance, President  
Calhoun First National Bank, Calhoun, Georgia

**"Our NCR 280 Terminals brought our stores in Texas two days closer to us."**

Archie W. Crittenden  
Director of Merchandise Information  
Dillard's, Little Rock, Arkansas

**Subscribers have it  
over pass-along  
readers.**

**order your own subscription**

Please send me COMPUTERWORLD for:

1 year - \$9\*

\*\$10 a year in Canada; all other  
Foreign, \$25 a year.

Charge My American Express Account:

If charge, we must have cardholder's signature:

First Initial	Middle Initial	Surname				
Your Title					May 9, 1973	
Company Name						
Send to: Address					State	Zip Code
City						

Address shown is:  Business  Home

Check here if you do not  
wish to receive promotional  
mail from *Computerworld*.

COMPUTERWORLD • Circulation Department • 797 Washington Street • Newton, Mass. 02160

**PLEASE CIRCLE 1 NUMBER IN EACH  
CATEGORY**

## YOUR INDUSTRY

- 01 Mining/Construction/ Oil & Refining
- 02 Manufacturing – Computer or data system hardware/peripherals/other associated mechanical devices
- 03 Manufacturing (other)
- 04 Utilities/Comm. Sys./Transportation
- 05 Wholesale/Retail
- 06 Finance/Insurance/Real Estate
- 07 DP Serv. Bureau/Software/Planning
- 08 Business Services (except DP)
- 09 Education/Medical/Legal
- 10 Federal, State and Local Government
- 12 Communications/Printing/Publishing
- 13 Other: \_\_\_\_\_

**YOUR FUNCTION**

- 01 Corporate Officer
- 02 Data Processing & Operational Management
- 03 Data Processing Professional Staff
- 04 Consultant
- 05 Lawyer/Accountant
- 06 Engineering-Management/Scientific/R&D
- 07 Sales/Marketing/Account Executive
- 08 Librarian/Educator/Student
- 09 Other: \_\_\_\_\_





# COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

## In Coding, Run Times, Core Used

# Benchmarks Show RPG II Beats Cobol

By Don Leavitt  
Of the CW Staff

TOLEDO, Ohio — The DP staff of St. Vincent Hospital and Medical Center is devoted to RPG II as the language best suited to its needs. But this devotion is not a matter of blind faith. Carefully planned and carefully documented tests proved RPG II is "one of the most pro-

## 'Dass' Uses JCL For Access Rights, Passwords Avoided

SAN FRANCISCO — OS/360 installations concerned about potential security "leakage" caused by casual handling of conventional passwords, can avoid them completely and still maintain a flexible security environment by using the Data Access Security System (Dass) routines from Information Management Inc. (IMI).

In a conventional situation, an IMI source explained, special passwords have to be entered, exactly as prescribed, whenever a user wants to work with a protected program or file. Because the entry has to be precise, he noted, users often carry passwords with them, pass them in an off-hand manner from person to person, or leave them unattended when unauthorized personnel have a chance of finding them.

Dass is based on the IBM-supplied password facility, but rather than working with an external entry, it assembles a "protect code" internally from user-defined but apparently non-security-related characteristics of the subject job stream. After assembling the code dynamically, Dass compares it to a range of acceptable codes and grants or withholds access based on the results of the comparison.

Dass imposes no special limitations on the user. The same range of access possibilities are available with these routines as with normal password operations. Some users or terminals can be limited to read-only access, for example, while others have full creation, updating and deletion privileges on a given file.

Selection of the job stream characteristics to be assembled and the sequence in which they are to be evaluated in the process can be altered by a security officer whenever he feels a leak may have occurred. No new list of passwords is prepared or distributed, however, since the security system is essentially transparent to the user, IMI noted.

Dass algorithms are maintained either through the IBM TSO processor or through a batch protect utility program. In either form, the routines take "no more than 2K bytes of core," a spokesman said. Dass is available for \$2,500.

IMI is at 447 Battery St., 94111.

ductive commercial languages available... significantly superior to Cobol," according to DP director Mike Pauken, CDP.

The tests were conducted about two years ago when St. Vincent converted from an IBM 360/20 to a 360/30. Pauken ran the programming language evaluation to be sure his staff would be using the most efficient language of the several under consideration.

The hospital's approach was to select two specific programs that represented the majority of its commercial workload and to write them in each of the languages being evaluated. The program functions were the same; each had the same number of I/O overlap areas specified and they were run against identical files.

The two programs selected were already written in DOS RPG. Only minor changes were necessary to recompile them under DOS RPG II. Then both programs were rewritten in Cobol by the same individual.

In both cases, the RPG II took less time to develop, to compile and to run than the Cobol, and required less core in the

bargain.

### Same Results Today?

The tests pitted a fairly early implementation of DOS RPG II against Cobol D. The statistics might be different if the tests were rerun today comparing a current RPG II to ANS Cobol, but the overall result would be the same, programmer/analyst Vern Luse said.

RPG II has matured tremendously, he noted, and now includes niceties such as the FORCE macro and Demand file use that allow the user to break away from the classic prestructured logic of a report generator.

First of the test cases was a program handling three sequential and two index sequential disk input files, a data table for look-up operations and a report to be printed. Program logic included matching two of the files and chaining among three of them. The final output was a census report, Pauken explained.

In this situation, the RPG II took only 16 hours to code and 24 hours to debug, compared to 28 hours for coding and 50 hours for debugging of the Cobol program. Compilation took less than half as

Language	Compilation/Run Times (Min:Sec)	Core (Bytes)	Coding/Keypunch/Debugging Times (Hours)			# of Source Statements
DOS RPG	3:36	58:21	25,769	20	3	32
DOS RPG II	2:44	26:57	20,921	20	3	32
Cobol D	7:16	29:00	22,745	32	4:45	80

The results of the second test showed St. Vincent Hospital exactly how well each language had performed and how much effort the DP staff had to put into developing the programs.

## 'DD/D' Describes Data on OS Files

WHITE PLAINS, N.Y. — OS/360 users faced with sprawling data files and applications can bring most of the information they need about the files under control with the Data Dictionary/Directory (DD/D) package from IBM.

The package accommodates both narrative and technical descriptions of data, along with facilities for maintaining data integrity and identifying responsibility, data relationships, data structures and application usage. DD/D would be most useful in a manufacturing environment, IBM noted, since it includes a glossary of more than 4,000 manufacturing data element definitions.

One of IBM's Installed User Programs (IUPs), DD/D is described as "especially timely" for users preparing to move to a data base/data communications operation, since the new package introduces discipline and standardization in the management of data. But DD/D is not "automatically" tied in with any particular data base management system, IBM said.

Data descriptions are entered on cards punched according to three preprinted specification sheets. The DD/D will also

accept data definitions from Cobol source programs either in card form or from the Cobol library. Any of these descriptions can be modified or deleted later to keep the dictionary current, IBM noted.

From the internalized dictionary, users can retrieve definitions of labels assigned to each data item, record layouts, keyword-out-of-context (Kwoc) listings, alphabetical label list and statistical printouts. Data definition statements, in either Cobol or PL/I form, can also be punched from the system, IBM said.

The data specification methodology of DD/D contains more than 80 operators, keywords, symbols and conventions for use in developing comprehensive and meaningful descriptions of data.

### Core Requirements

DD/D is coded in PL/I for the F compiler and operates under either OS/MFT or MVT. It requires a 128K partition for the "build and change" programs and 192K bytes for the print function.

As an IUP, it is leased under license agreement for \$475/mo, but payments

In the first test, the RPG II program compiled in 2 minutes 24 seconds, used 14,455 bytes and ran in 4 minutes 28 seconds; Cobol D compiled in 6 minutes 20 seconds, used 22,988 bytes and ran in 5 minutes 19 seconds. — summary of benchmark results.

long under RPG II and execution took almost a minute less than the five minutes and 19 seconds required by Cobol.

The second test program utilized three sequential disk files and cards as input, four sequential disk files and punched cards as output, along with reading and writing from the console typewriter. Program logic involved matching all files and a control break on one field.

This program was to update a detailed revenue file and, at the same time, create temporary files for billing. Again, coding, debugging, compilation and execution times were all lower with RPG II than with Cobol D.

The distinction between RPG II and "old fashioned" RPG was highlighted by the statistics on core usage in both tests, and by the run-time figures in the second. RPG took more core in both situations, and ran 58 minutes compared to almost 27 minutes for RPG II and 29 minutes for Cobol D in the second test.

The programs were run on a 360/30 with 96K bytes of core (all from IBM), 2319 disk drives, a 2540 card reader/punch, and an 1,100 line/min 1403 NI line printer. Since that time, St. Vincent has expanded to 156K bytes of core, utilizing an add-on from Computer Hardware Consulting Services (CHCS).

## T/S Firm Adds Staff To Work With Users

PITTSBURGH — A Software Services Division has been formed by On-Line Systems Inc. to work directly with users in developing, modifying and enhancing applications, analyzing corporate information requirements and identifying present and future DP opportunities.

The new division will also present courses in programming languages and application of on-line technology and provide consulting services in any area of time-sharing applications. The company provides dial-up service to 16 metropolitan areas in the U.S. and is based at 115 Evergreen Heights Drive, 15229.

DO YOU NEED A GOOD MACHINE UTILIZATION AND JOB ACCOUNTING SYSTEM?  
COMPUT-A-CHARGE IS IT!

# COMPUT-A-CHARGE

SOLVES MULTI-PROGRAMMING BILLING PROBLEMS AUTOMATICALLY.

Comput-A-Charge provides an efficient billing system; allows you to analyze the performance of your computer because it breaks down costs so effectively. Used with the IBM 360 or 370, it analyzes every job in your system, computes charges for exact CPU time, elapsed time and I/O count, and charges for each class of peripheral device.

What other system can match this performance?

DAILY REPORTS: Summary of jobs... idle time... multi-programming graph... class utilization... device utilization... shift analysis.

PERIODIC REPORTS: Device utilization... cost feedback... job cost utilization... application utilization... major application graph... total system summary.

BILLING: By core used, core requested, CPU, I/O cards read, lines printed.

For more information on how you can maximize the efficiency of your computer with automatic machine utilization and job accounting, just mail this coupon, or call (609) 667-8770.

value computing inc.  
496 Kings Highway North  
Cherry Hill, New Jersey 08034

GENTLEMEN:  
PLEASE SEND INFORMATION ABOUT

COMPUT-A-CHARGE  
 CALL ME FOR AN APPOINTMENT

NAME \_\_\_\_\_ TITLE \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

TELEPHONE \_\_\_\_\_

System/370  
LEASES

LOWEST RATES BEST TERMS

COMPUTER MARKETING INC. 7704 Seminole Avenue, Melrose Park, Pa. 19126

CALL: (215) 635-6112

FOR SALE OR LEASE  
IBM/370-155 CORE  
3360-3 (512K)

Available 30 to 45 days

Transitional Computer Corporation  
135 West 50th Street • New York 10020  
• (212) 489-8710

Quantor  
common Sense  
in  
Grocery Chains



A large grocery chain  
shelved a competitor system  
for Quantor COM.

Quantor

520 Louise Avenue, Mountain View, California 94040 (415) 965-3700.  
Oak Brook (Chicago) (312) 654-3720. New York, N.Y. (212) 279-3280.  
Washington, D.C. (703) 960-3707. Los Angeles, Calif. (714) 833-0157.  
Miami, Fla. (305) 448-3650. Atlanta, Ga. (404) 237-1176.  
Houston, Texas (713) 772-1772. Philadelphia, Pa. (215) 643-2250

The National Computer  
Conference:  
We've got it covered.

For details, contact the nearest Computerworld Representative:

Boston  
Bob Ziegel  
(617) 332-5606

New York  
Don Fagan  
(212) 594-5644

Los Angeles  
Bob Byrne  
(213) 477-4208

San Francisco  
Bill Healey  
(415) 362-8547

or write to: Judy Milford, Computerworld, 797 Washington Street, Newton, Mass. 02160

## 'AMS' Includes Data Base Management, Application Design, Coding, Support

DALLAS — Application Management System (AMS) software from Tres Computer Systems Inc. is an integrated application design, programming and documentation system through which OS/360 users can control the buildup and maintenance of large, complex information systems.

AMS includes a formalized structuring of system development functions ranging from design through programming, documentation, decision table techniques and testing. It also has a data base management

system to work with complex, interrelated files and a data base language which supports all IBM file and record structures.

A built-in design and programming language (DPL/I) provides a high-level interface between the application systems and IBM's OS, Tres said, and documentation requirements are considered so important to the system that program logic cannot be changed until the supporting documentation is updated.

AMS includes a generalized retrieval and report/file writer

system (Tresgen). Users will also be able to access modules written in Cobol, Fortran, Assembly and PL/I, through a DPL/I CALL. Thus coding developed independently of AMS can be included in programs controlled by the system, Tres noted.

AMS utilizes four major systems concepts. The so-called Platform system provides control of operating system facilities in terms of the application environment. It structures the DP interfaces into four skill levels: application system user, application system designer/programmer, software programmer and operating personnel.

The concept of application management integrates data base data and program management into a coherent body of controls common to all applications. The goal of the structuring concept, Tres said, is to modularize programs into logical processing units with specific processing functions.

### For Novice, Old-Timer

Both experienced and novice Fortran programmers benefit from the use of Watfiv, the company claimed, since the high compilation speeds and extended diagnostic aids cut debugging time sharply.

The time-shared Watfiv is available through any of the NCSS local offices. The original batch-oriented package from Waterloo University requires a 128K byte 360/370 CPU operating under OS.

National CSS is headquartered at 300 Westport Ave., 06851.

Watfiv logic was developed at the University of Waterloo, Waterloo, Ontario, and is available as a batch-oriented OS/370 package from the school's Computer Science Department. The NCSS implementation is the only time-shared version of the system that is currently available, a university source noted.

### Spotting Errors

Errors that Watfiv is capable of spotting include use of uninitialized variables, subscripts that are out of range, illegal entries in the range of DO loops, and subprograms redefining constants, expressions, DO loop parameters or ASSIGNED GO TO indices. Without Watfiv, NCSS said, these errors could be very difficult and, in large programs, even impossible to detect.

When Watfiv detects these and other errors, it reports the names of the variables involved, an explicit description of the violation(s), and the location in the source program where the errors occurred.

Free-format I/O without FORMAT statements, CHARACTER

## 'ISL' Simulates Analog CPU

KENNEWICK, Wash. — Simulation of continuous processes and control and data logging functions can be performed up to 50 times faster on a mini equipped with Interactive Simulation Language (ISL) than on a CDC 6000 series or IBM 360/50 mainframe equipped with standard floating point methods, according to the ISL developer, Interactive Mini Systems Inc.

ISL has been installed on the DEC PDP-8 and -12 families of minis, as well as on PDP-15s and Data General Novas. Operating in as little as 4K words of core, ISL is essentially a digital simulation of an analog computer. It includes analog blocks for integration, multiplication, addition, time delay and generation of non-linearities, as well as logical blocks such as GO TO, conditional transfer and relays.

It has many of the same advantages over real analog computers as other simulation languages, but unlike some others, it permits and even encourages interactive participation in the operation by the user. Faster than most simulators, it is still much slower than a real analog computer, the company noted.

The basic ISL for a PDP-8 is available for \$2,000. Various functions can be added, generally for \$100 each, but "it would be hard to pay more than \$3,000" for a completely tailored package, a spokesman said.

The company is at 5312 W. Tucannon, 99336.

### BEFORE

Our May 30 Preview Issue (Color close is May 11. B&W close is May 18.)

### DURING

Our June 6 Show Issue (Color close is May 18. B&W close is May 25.)

### AFTER

Our June 13 Wrap-Up Issue (Color closes May 25. B&W closes June 1.)

Whether or not you're going to The National Computer Conference, Computerworld's last-minute, complete coverage of the new, consolidated show is must reading — including the latest information on the wide variety of new products which will be displayed. Only a weekly newspaper can give you such complete and up-to-date coverage. And Computerworld is the only newsweekly for the computer community.

# People who think this far ahead are thinking BASF/2000A.D.



BASF/2000 A.D. The computer tape as advanced as your next idea. It's being used more and more. In aerospace technology. In advanced time-sharing operations. In university research, and business data storage. Any place where the margin for error is critical.

BASF/2000 A.D. The 100% certified 3200 fci tape that combines greater sensitivity and error-free uniformity with a thinner, less abrasive coating. The tape that actually reduces head-wear while ensuring reliability you can live with for years.



BASF/2000 A.D. If you're in the business of planning for tomorrow, or just keeping up with today, it should be part of your future.

Start thinking 2000 A.D. Talk to your BASF representative now. Or send for all the facts on our full line of magnetic media products. **BASF SYSTEMS**, Crosby Drive, Bedford, Massachusetts 01730.

**BASF SYSTEMS**  
Division of BASF Wyandotte Corporation



**BASF for people who really know.**



# let's talk!...

## ...about the biggest computer show on earth

Now everything you need to know about the 1973 National Computer Conference & Exposition is as close as your telephone.

Just give us a call on AFIPS' new toll-free hot line and we'll send you all the facts on how to register for the biggest computer show on earth—including this year's largest display of computer hardware, software, systems and services.

73 NCC brings it together for the first time. It's your once-a-year opportunity to look, listen and learn about the latest developments in data processing. To share ideas and experience with leading experts. To gain a wealth of practical knowledge and know-how which can spell immediate dividends for you and your company.

We've structured the 73 NCC program to meet your day-to-day requirements. A total overview of

data processing and its applications, emerging uses, and its impact on user industries and the world economy. More than 80 sessions, panels and seminars providing in-depth coverage of Methods & Applications and Science & Technology.

All this plus an exhibit program which puts a world of EDP information right at your fingertips—with more than 200 organizations ready to assist you in meeting your specific data processing needs.

Act now to avoid long lines at the New York Coliseum, June 4-8. You can pre-register for the entire conference, for any one day of the conference program and exhibits, or for all five days on an exhibits-only basis. Beginning March 12, just dial 800-631-7070\* for complete registration, housing and conference information or write: 73 NCC, c/o AFIPS, 210 Summit Ave., Montvale, N.J. 07645.

*\*In New Jersey, dial 201-391-9810*



**800-631-7070**



**1973 National Computer Conference & Exposition**  
**June 4-8 • New York Coliseum**

# COMMUNICATIONS

## Data Briefs

### Technical Sessions, Exhibits Included in ICA Conference

BOSTON — The International Communications Association will hold its annual conference here May 13-17 at the Sheraton Boston Hotel.

Among the technical sessions planned are four "case study" presentations by ICA users, and seminars dealing with data communications economics, management and interconnection.

Other sessions will deal with problems of implementing an international communications network, domestic satellites and a discussion on regulatory issues.

More than 100 communications carriers and equipment suppliers will be represented at the exposition which is part of the conference.

Information is available from J.D. Martin at National Steel Corp., 700 Chatman Center, Pittsburgh, Pa. 15219.

### Four Terminals Tied To Modem With Multiple Access Coupler

NEWPORT BEACH, Calif. — Collins Radio Co. has a multiple access coupler (MAC) that can connect four data terminals to one modem. The TE-795 has four RS-232 terminal input ports that can direct data to either one or two modems.

A front panel switch enables the user to select the required line, and diagnostic indicators monitor the condition of the line being used. The diagnostics include Request to Send, Data Carrier Detect, Transmit Data, Receive Data and power indicators.

Several TE-795 units can be interconnected to allow an even greater number of lines to use a limited number of modems, a spokesman said. The coupler costs \$900 from Collins at 4311 Jamboree Road, 92663. Delivery is four months.

### Unit Converts BCD to Ascii

ITASCA, Ill. — The DL 1200 Digilogger from Nationwide Electronic Systems, Inc. converts 10 digits of parallel 1248 BCD data to serial 8-level (11-bit) Ascii code suitable for driving teletypewriters and other Ascii devices.

The Digilogger inputs are strobed and loaded into a buffer memory within 100 nsec of log command which eliminates the need to hold input data constant for scanning, the firm's spokesman said.

At a price of \$845 the unit is available from 7N662 Route 53, 60143.

### Service Facility Opens in N.Y.C.

SOMERVILLE, Mass. — National Data Industries, Inc. (NDI), an independent supplier of time-sharing terminals and data processing equipment, has opened a branch in New York City.

NDI-Manhattan has service and maintenance facilities for customers.



World's First 1200 Baud  
Full Duplex  
Two Wire Modem

**vadic**

505 East Middlefield Road,  
Mountain View, Calif. 94040  
(415) 965-1620  
TWX 910-379-6567

Dear Ma:  
Remember when you took me to see the magician that sawed the lady in half?  
Vadic has just done the same thing to line costs!  
Believe it or not, they have a modem capable of full duplex data transmission at  
1200 bits per second over dial-up or two-wire leased lines.  
Think of the impact this will have on users of CRT's, cassettes, and all sorts of  
buffered terminals who have been forced to piddle along at 300 bits per second or live  
with half duplex 1200 bits per second operation.  
This modem is really something, Ma. It provides four times the data rate of your 103  
while maintaining the same discipline for connect, hand shaking, and disconnect.  
Imagine eliminating the complicated and inefficient half duplex mess forever. The  
zero turn around delay will save bundles on line costs.  
I hate to tell you, Ma, but the VA3400 can be used in Vadic's Multiple Data Set or  
standalone units which have analog and digital loopback, display of all EIA interface  
signals, built-in 300 and 1200 baud test signals. It can also be used with any of  
Vadic's automatic dialers.  
The price? Better sit down, Ma. Just \$750, with OEM discounts available.  
Delivery is 60 days A.R.O. Better phone your order in soon.

P.S. Who's Vadic? They've delivered  
over 20,000 modems to date.

Your independent thinking son,  
*Alexander Graham Jr.*

VA3400: The VA3400 is a modular, multi-line modem module for PC interface. It has a serial data port, a parallel data port, a dial-up line, a leased line, and a telephone line. It has a built-in 300 and 1200 baud test signal generator, and a built-in automatic dialer.



Ma Bell  
195 Broadway  
New York, NY 10007



### Novars Tied to 360/30

## On-, Off-Line Uses Save \$125,000/Yr

By David P. Meade

Special to Computerworld

ST. PAUL, Minn. — A lot of work gets done after hours at the Automotive Battery Division of Gould, Inc. through the use of a terminal communications network. Details of hundreds of incoming customer orders and outgoing shipments flow into headquarters from remote division manufacturing plants, central control records are updated, and current status information goes back to the plants to guide the next day's service operations.

All this activity takes place overnight between a computer at headquarters and unattended data terminals at the plants. The system combines the benefits of on-line dynamics and off-line economy to assure fast order processing while saving the division over \$125,000 a year in direct order handling costs.

The communication terminals — GTE Novar 5-51s — function in off-line mode during the day, recording order, shipment and production data as transactions occur. They also produce needed working documents for plant personnel and simultaneously create a tape record to be forwarded later to headquarters.

Power-typing capability, involving a high-speed search of customer master tape records, reduces order preparation time while virtually eliminating errors. The only new information the terminal operator enters is order number, shipment mode, request date and item quantity.

The search for terminals was launched in December 1970, with the emphasis on faster data transmission between the plants and headquarters, and, just as important, an increase in data entry and transmission accuracy. The system also had to be easy to operate at the plant end, economical and flexible. The decision to install the 5-51s was made in April 1971; the first terminal went into service

in July that year, and the system was fully operational at all 12 plants within three months after that.

Transmission speed of the terminals is up to 1,200 bit/sec, and the digital tape cartridge has a storage capacity of 73,000 characters to accommodate records of the full day's order and shipment transactions at the plants. An auxiliary tape unit makes it possible to power-type data retrieved from customer master tape records while simultaneously recording the data on the transmission tape in the main unit.

Bell Data Access Arrangements link the plant terminals to headquarters via four standard voice-grade Wats lines. The control computer is an IBM System/360 Model 30, with one partition devoted to the terminal transmission function.

In addition to its order handling capabilities, the terminal system provides a bonus benefit to management in the form of more reliable, more current information about what is happening at the remote manufacturing plants.

*David Meade is director of information systems at Gould, Inc.*

### Long-Term, Variable Cost Lease May Be Offered for Bell Units

By Ronald A. Frank

Of the CW Staff

NEW YORK — AT&T may be planning some important changes in the pricing of its data modems, terminals and other equipment.

Instead of the traditional month-to-month rental of its equipment, Bell is considering the introduction of leasing arrangements whereby users would pay a higher initial monthly rate in return for lower payments later on.

The revisions in AT&T equipment rentals are apparently being spurred by increasing competition from suppliers of independent equipment which can be installed in place of carrier-provided units.

Although no firm plans have been announced, AT&T is reportedly considering a 10-year lease under which a user would initially pay between 25% and 100% of the total cost for the equipment. If he paid the full cost initially, the user would save about 35% over straight monthly rentals for the same period.

Also being considered are maintenance

options whereby the user could pay an annual prepayment charge. For users who paid ahead there would be a savings over the usual maintenance fee included in each monthly bill. Another option would be a flat hourly rate for Bell maintenance representatives when they are called to a site.

Another option considered by Bell management but rejected for now is outright sale of equipment to users.

All the moves away from traditional month-to-month rentals are an extreme step for AT&T and its operating companies. And before any of the proposals can be implemented, serious regulatory and legal questions will have to be answered.

The phone companies have always had to justify their rates as being fully allocated to cover the costs of equipment and the overhead associated with supplying equipment and service to the user. Lease plans that allow Bell to recover all projected costs associated with equipment for 10 years might not win the necessary approval of regulatory commissions. In addition Bell must live with the restrictions of its 1956 consent decree.

But Bell is becoming much more conscious of customers' costs. Illinois Bell already provides users considering non-carrier equipment with computerized cash flow analyses comparing Bell rentals with independent lease plans.

And another indication that AT&T would like to get more "front-end" money from the user is the trend toward increased installation charges. An example is the new private line, high-density, low-density rate proposal made by Bell [CW, March 7].

Bell is undoubtedly feeling the competition from independent equipment suppliers and impending specialized carriers. In this environment, Bell apparently feels it must get as much money as possible from a user before the customer has second thoughts and begins to consider alternate suppliers.

### MCI Using Us to Fight AT&T: PCI

WASHINGTON, D.C. — MCI is using the FCC application of Packet Communications Inc. (PCI) "as another weapon in the MCI-AT&T competitive struggle," according to allegations included in PCI comments filed with the FCC in answer to earlier responses from MCI and others.

PCI told the commission that it was gratified that its proposal for a packet-switched network [CW, Feb. 7] had met little opposition. The MCI suggestion that an FCC rulemaking procedure on value-added networks was necessary serves only as a delaying tactic, PCI said.

The MCI suggestion was designed to set common ground rules for all value-added carriers rather than allowing Bell to dictate its own terms, an MCI spokesman said. MCI has formed an affiliated com-

pany to operate a value-added network [CW, April 11] and the firm welcomes open entry into the field, the spokesman added.

"MCI's obvious purpose is to delay and impede any potential competition for as long as possible," PCI told the FCC.

The PCI application is being considered by the FCC staff which will then make its recommendations to the commission. An FCC staff spokesman said the PCI application will be considered after a recommendation is issued on AT&T's proposal for its Digital Data System (DDS).

The FCC spokesman could not fix a time when it will complete consideration of the PCI application, but a rulemaking procedure could delay the commission's decision, he said.

LOW-PRICED  
**acoustic  
coupler**  
MODEL 150 . . . NO FRILLS

- For use with all Series 33 TELETYPE Terminals.
- Half/full duplex switch.
- Carrier indicator.

**\$147**



**COMDATA**  
7544 West Oakton Street  
Niles, Illinois 60648  
Phone: 312/692-6107  
See Us In Booth 2016,  
National Computer Conference

## Communications Panel Agrees: Support Linked With User's Credibility

KANSAS CITY, Mo. — One of the chief problems a communications user faces in procuring prompt and effective service is establishing credibility with the various suppliers when he has correctly pinpointed a problem with that particular supplier's equipment, according to panelists at a recent communications workshop.

"It took a year until vendors believed my analysis of the problem and then things smoothed out tremendously," observed Bob Kuykendall of Massey Ferguson Inc.

The purchase of a data test set was very beneficial in this regard, he said.

Dick Fioretto, of Panhandle Eastern Pipe Line, said his firm uses Milgo ICC modems with

built-in test capability and he always makes sure it "isn't in our own equipment before we call the phone company."

Don Class of the Kansas City Police Department said his solution was to start at the top — with the president of Southwestern Bell and the president of IBM's DP Division. "Then the guys down the line are usually quite responsive," he said.

### Terms Differ

Terminology is another area that can create problems when dealing with different vendors, Class said at the Computer Caravan/73 session.

For example, when his department ordered half-duplex lines from Southwestern Bell, it received 4-wire full-duplex equip-

ment, apparently as a matter of policy.

Unfortunately, the department didn't know its equipment was operating in full-duplex mode and when it later ordered and got half-duplex lines from AT&T they couldn't be interfaced with the existing setup. Once the conflict was identified, he said, the new lines had to be reconfigured in full-duplex mode.

To IBM and the telephone company the term "send-receive" has opposite meanings, Class warned. "Ninety five percent of the time when they install a line that's faulty, asking the question 'have you swapped the pairs?' will solve the problem," he said.

Problems can also arise if the

phone company changes lines since this may necessitate adjusting data set volumes. Some modems offer automatic volume equalization adjustment, and most users familiar with this area agreed it could often be a worthwhile option.

Class said whenever he called the phone company it would say the line was okay.

But then after IBM comes in, puts a scope on the line, and comes up with some specifics as to the failure in the line, and the phone company is informed of the diagnosis, "they'll fix it," he said.

Part of the problem lies in the fact that the phone company does not seem to be able to put a scope on a user's line because of tariff regulations, he said.

## One of the best things about the Bell System's Dataphone® 4800 data set is the maintenance behind it.

This new solid state data set transmits at 4800 b.p.s. over basic, unconditioned, private-line facilities.

It has a 50 millisecond turnaround time that makes it suitable for multi-point or point-to-point systems.

And it offers convenient local and remote loop-back testing. Which means trouble can be readily isolated between your equipment or ours.

Perhaps even more important, the Bell System has what is called the Data Technical Support Team.

This team is made up of representatives from various levels of the Bell System, from the local company to Bell Labs.

When necessary a data problem can be taken to the level where it can be solved quickly. Usually within hours.

At AT&T and your local Bell Company, we know how costly "downtime" can be to your business. You don't have to say another word.



**We hear you.**



# SYSTEMS & PERIPHERALS

## Bits & Pieces

### Varian Announces A/D Minicomputer System

IRVINE, Calif. — Varian Data Machines has announced a low-level Analog Input System designed to provide high-noise immunity and a wide programmable range for conversion of low-level analog signals into digital computer format, according to the firm.

For use with Varian 620 and V73 series computers, the Model 620-855 is a self-contained unit which provides an analog-to-digital converter, low-level multiplexer, sample-and-hold amplifier and programmable timer.

Price of the unit with 16 channels is \$16,000 from 2722 Michelson Drive, 92664.

### Disk System Replaces Nova 4019s

CANOGA PARK, Calif. — Nova series minicomputer users can get a direct replacement for the Nova 4019 disk and control unit from Alpha Data Inc.

Features of the DS-N Disk System include: 256M bit storage capacity; 250 kword/sec transfer rate; 8.4 msec access time.

DS-N Disk System prices range from \$4,570 to \$20,000 depending on capacity and quantity from 8759 Remmet Ave., 91304.

### Moving a Nova On-Line

PALO ALTO, Calif. — The AED 2408 multiplexer, from Advanced Electronics Design, interfaces a Nova computer to eight I/O serial asynchronous terminal devices.

Features include one slot computer I/O board; selectable data rates/channel; channel selectability from five through eight bit/char.; odd/even or no parity bit; and one or two stop bits.

Each channel has its own DMA register to load its starting memory address with an automatic increment of the DMA address register after each I/O operation.

The multiplexer unit is priced at \$2,250 from 3197 Park Blvd., 94306.

### PDP-11 Users Get Linc Tape

BELTSVILLE, Md. — Linc Tape direct access memory for the PDP-11 minicomputer is available from Computer Operations, Inc.

Included in the system is a Linc tape loader, utility software and a keyboard executive. Transfer rate — via direct memory address — is 8,400 byte/sec and storage capacity is 335K byte/drive.

The basic system provides the capability to read and write on COI 10-track tape. An option, CO-571D, is available for the PDP-11 Linc tape.

Cost of the basic unit is \$4,500. The CO-571D option is \$850. CO-505 slave units, each providing 335K bytes of additional storage cost \$1,700 each from 10774 Tucker St., 20705.

## For Fast I/O

### Slash 4 Mixes Core, MOS Memories

By Michael Weinstein

Of the CW Staff

FORT LAUDERDALE, Fla. — Datacraft has unveiled a medium-scale computer, the Slash 4, which uses a 24-bit word and offers users the optional ability to mix core and semiconductor memory in one mainframe.

The mixing of memory media allows users to run standard operations with the core memory (cycle time 750 nsec) and use the semiconductor memory portion

(cycle time 200 nsec) for fast I/O operations.

In some operations data can be transferred through the faster semiconductor portion with no intervention needed from the central processor, Datacraft said.

As I/O operations become more complex, they can still be routed through the semiconductor portion with needed central processor intervention obtained on a cycle-stealing basis, a spokesman added.

Minimum system configuration is 8K

words (24K bytes) of core memory. This is expandable to 256K words, of which 16K words can be semiconductor, the spokesman said.

The basic unit comes with four priority interrupts that can be expanded to a maximum of 48 and one I/O channel with the ability to add up to 24 channels.

### Operating Systems

Four operating systems are offered with the Slash 4 including: a resident operating system for simple applications such as process control and real time monitoring; a tape operating system; a disk operating system for batch operations; and a disk monitor system.

The disk monitor system (DMS) has the most expansive features for users, Datacraft said. It is a real-time system providing foreground multiprogramming concurrent with background batch processing. Additional features include spooled I/O, interactive terminal support, dynamic memory allocation, timer scheduled programs and dynamic file creation, the firm said.

### Languages Available

Languages available include Fortran, Basic, RPG and Snobol, with overhead software including Forgo (a fast Fortran load-and-go program), an editor program and a macro assembler.

Prices start at \$19,900 which buys a basic system with 8K words of memory, parity, hardware multiply/divide/square root, priority interrupt control system, four external priority interrupts, five registers (three for indexing), one 8-bit I/O channel and basic software.

A typical system with disk subsystem and other peripherals will cost in the \$70,000 range from P.O. Box 23550, 33307.

## RCA Demonstrates Laser Memory: Core, Drum, Disk Replacement?

PRINCETON, N.J. — RCA has demonstrated an experimental computer memory, based on laser-holographic technology, which can perform full cycle data processing operations such as write, store, read and erase.

The significance of RCA's demonstration is that laser-holographic memories may be the base of a new generation of mass memories equal in capacity to, but 1,000 times faster than the largest disk systems currently available, according to an RCA spokesman.

"The holographic memory has the potential, when fully developed, to replace the entire hierarchy of core, drum and disk systems now used, and thereby simplify the whole architecture of computers and many other information systems," he added.

### Flash Gordon?

In operation, an argon laser beam is passed through two acousto-optic crystals. The crystals deflect the beam in

direct proportion to the frequency of sound waves made to pass through them.

One crystal bends the laser beam from left to right, the other, up and down.

This bending results in 1,024 distinct

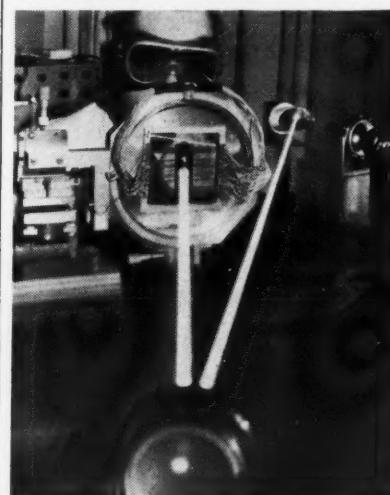
## Looking Ahead

positions, called "hololens," to which the beam can be deflected. The hololens splits the beam into two parts, one of which goes straight through while the other is diffracted to fall on a flat plane 3 inches square and composed of 1,024 liquid crystal cells.

These cells introduce digital information into the laser beam in the form of tiny areas that are dark or light.

These correspond to the "ones" and "zeroes" of binary code and constitute the data to be written into memory.

RCA's experimental unit comprises 1,024 pages each with 1,024 bits, for a total capacity of more than 1M bits.



A laser beam is used to write, store, read and erase information in an experimental holographic optical computer memory.

## 125-, 200 Line/Min Printers Interface Most Minicomputers

DARIEN, Conn. — Minicomputer users can obtain a Tally Series 2000 line printer from Digital Associates Corp.

The 132-column printers — Model 2100, 125 line/min and Model 2200, 200 line/min — are offered as complete systems including all necessary interface hardware, cables, connectors and documentation for the following minis: DEC PDP-8, -11 and -12 series, Data General, Honeywell 316 and 516, HP 2000 series, Data-point 2200, all others using RS232 communications interfacing.

Options include a 96-character set and serial interfaces enabling the printer to operate as a receive-only printer terminal.

Lease prices start at \$111/mo for a complete system, \$79/mo for the printer only from 1031 Post Road, 06820.

**the centronics phenomenon:  
a printer that's  
100% faster  
for 12% more  
money**

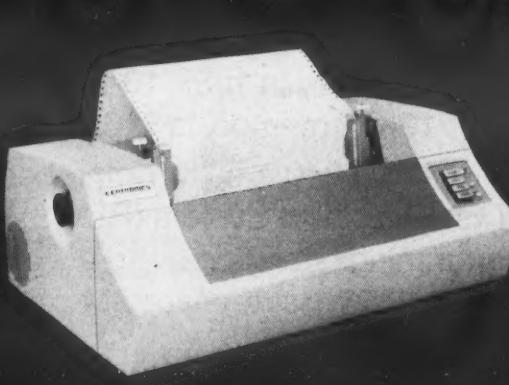
### Model 102A printer. 330 cps.

Twice as fast as our first printers  
\$4,635. 12% above our 101A.  
18% over the 101.

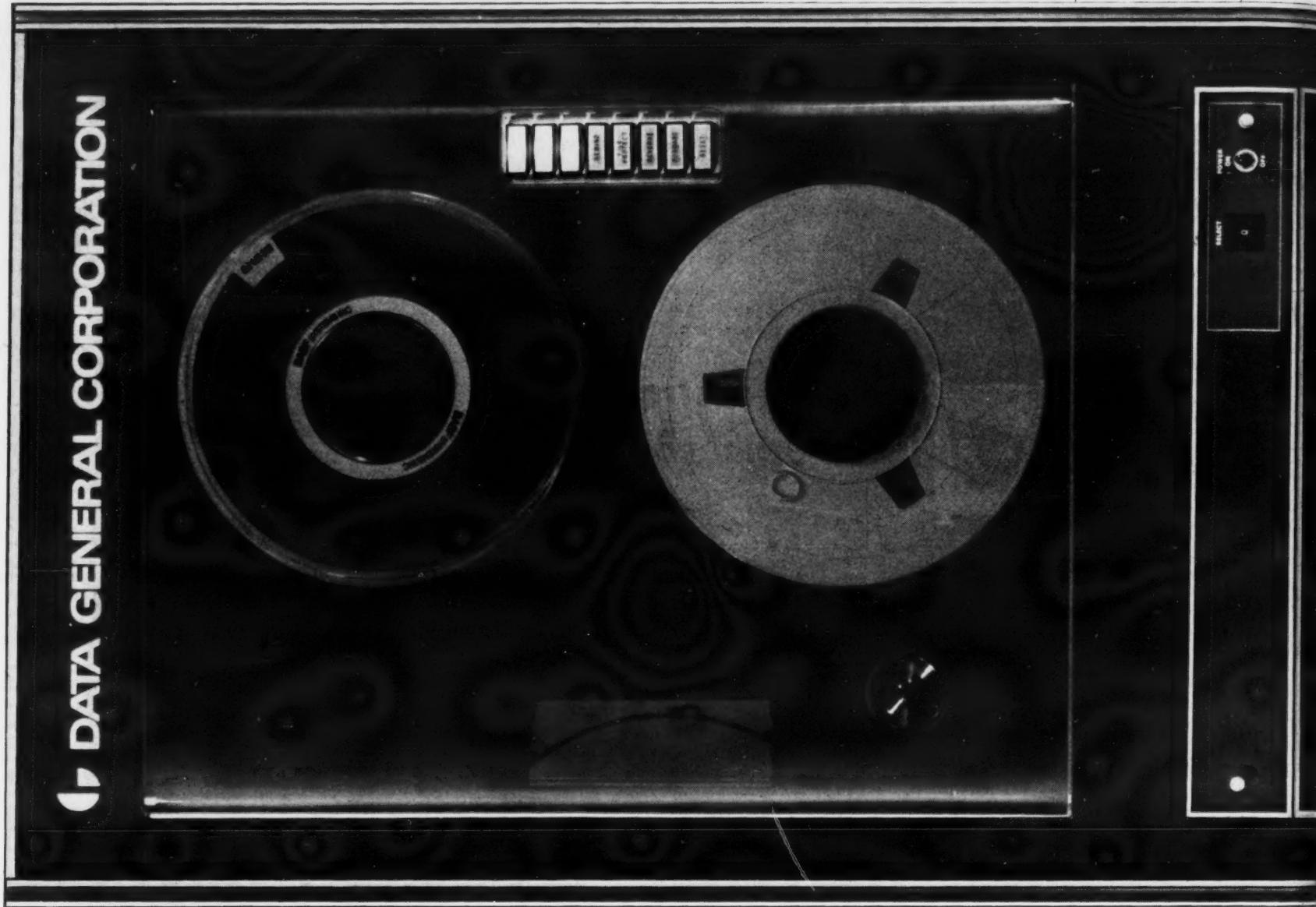
A 132-column, 125-lpm  
serial impact printer.  
Multicopy, Computer and  
communications interfaces too.  
Now ask about 30-day delivery  
in quantity.

### CENTRONICS

centronics data computer corp.  
one wall street, hudson, n. h. 03051  
telephone (603) 883-0111  
central region (513) 294-0070 (ohio)  
western region (714) 979-6650 (calif.)



DATA GENERAL CORPORATION



## DATA GENERAL INTRODUCES THE LOADED NOVA.

The loaded Nova is the new Nova 840 and the most comprehensive set of software/hardware capabilities ever available with a Data General computer.

It comes with a built-in Memory Management and Protection Unit that lets you expand main memory to 128K 16-bit words. Base price with 16K of memory is \$16,530.

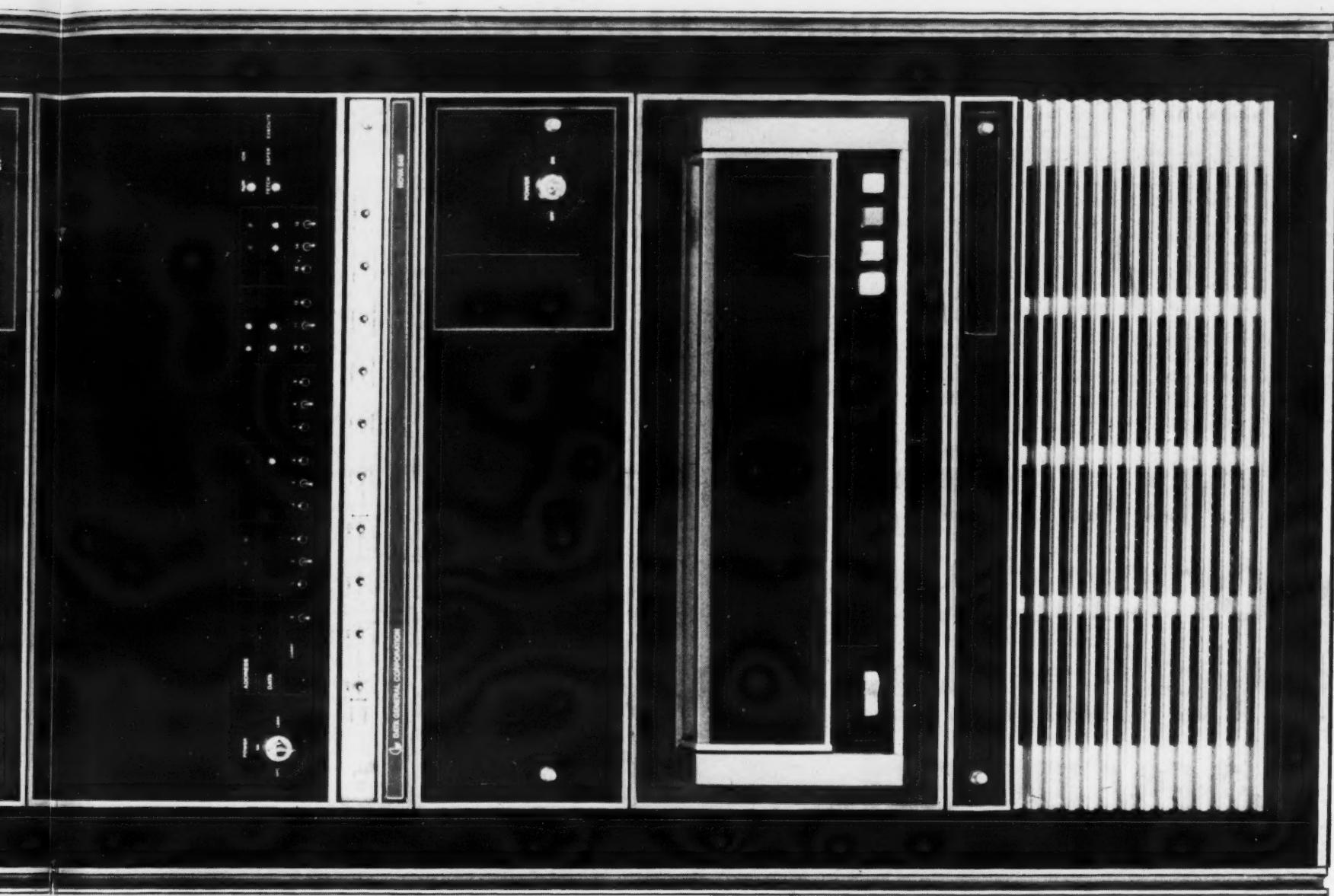
Nova 840 runs a comprehensive Real-time Disc Operating System (RDOS) for dual programming operations.

A new BATCH executive lets you pick your I/O devices, load your jobs, and walk away.

It has our new Fortran 5, Extended ALGOL, Extended Timesharing BASIC, and a whole library of proven Data General software; proven software that we can deliver now.

And our Remote Job Entry software can let the 840 double as a high-powered terminal to a big computer someplace else.

With the right kind of configuration (like the one shown), all that software is available free.



## ON YOUR DOORSTEP IN UNDER 90 DAYS.

The Nova 840 in the picture has a central processor with 32 to 64K of main memory, a high-speed Floating Point Processor, hardware Multiply/Divide unit, fast-access disc storage, and 9-track mag tape.

The picture doesn't show lots of the other things you can get with Nova 840: line printers, card readers, Novadisplay terminals, fixed-head Novadiscs, moving-head discs, Nova Cassette tape, communications interfaces.

Nor could we show you the applications

and service experience we've developed in the course of building, installing, and supporting over 6,000 Nova computer systems all over the world.

If you're looking for more throughput than you could ever get with a minicomputer, for better access to system resources, at a lower price, call Data General.

Call with an order: we'll put a loaded Nova on your doorstep in less than 90 days.

 **DATA GENERAL**  
Southboro, Massachusetts 01772

# Interactive Network Unveiled for Graphic Operations

**SOUTH WINDSOR, Conn.** — An interactive Design System from Gerber Scientific Instrument can allow engineers to work jointly with associates thousands of miles away on particular job problems or to use local computer power to compose, digitize, edit and plot complex mechanical drawings in final form.

Hub of the interactive system is a central processor interfaced to from one to six remote terminals.

Each remote terminal is provided with a satellite process controller capable of supporting one or more local work stations.

Operating capabilities for each work station can be broadly divided into three modes: digitizing, editing and plotting.

While no two of these modes can be operating at the same time, the operator can switch modes at will.

From each remote location (terminal), operations are independent even though they are using the common central processor as the heart of the network.

## Hardware

Hardware elements of the interactive system consist of the CPU, disk storage subsystem,

magnetic tape cartridge I/O device and teletypewriter at the network center and digitizer plotter, video display terminals, satellite process controller and keyboard/display at the remote locations.

The CPU has a solid-state core memory with a basic size of 12K words, expandable to 33K words (word size is 16 bits).

The disk subsystem is used to store data files and program files for each design terminal as well as libraries of master system symbols and individual terminal symbols used in job definition. Disk capacity is 1.2M words, ex-

pandable to 9.6M words.

A standard I/O typewriter unit is provided for system control.

The magnetic tape cartridge I/O device is used for data and program file loading and dumping.

## At the Terminal

Each terminal is equipped with its own minicomputer with memory capacity of 2K words. This satellite processor acts to provide program control for local devices and to gather data for the host CPU.

An alphanumeric and function keyboard is provided for each terminal with at least one edit or

digitize work station. Forty-eight alphanumeric keys are provided for entry of parameter values and text with 80 encoded pushbuttons provided for entry of system function commands.

An alphanumeric display is provided with a capacity of 80 characters. The display functions to inform the operator of current job state.

The primary means of inputting drawing descriptions is a digitizer with a common drafting machine. The unit allows sketches to be digitized and edited with immediate plot-back.

A storage CRT and stylus are available to allow high-speed overview and window-view edit and proofing capabilities.

Software is designed to allow the user to dynamically construct, store, retrieve, manipulate, associate, edit and reproduce information visually or interactively.

Also included are all programs needed for the network's operating system and peripheral drivers coupled with graphics packages needed to communicate with a central data base.

A basic system with host CPU and one terminal work station costs about \$88,000. Costs vary from that point dependent on the number of remote stations used.

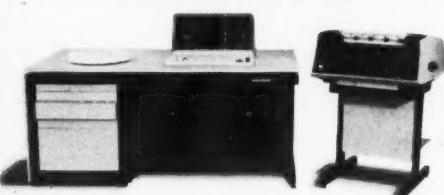
Gerber is at 83 Gerber Road, 06087.

# You design software for end users. We have the systems they need.

Why stop at selling or leasing software systems to end users? Now you can offer them complete minicomputer package systems.

This way they'll be able to get everything they need from you. And you'll be able to get everything you need from us.

**Wider choice of peripherals** We offer a full line of peripherals to go with our SUE and MAC minicomputers: IBM compatible 5440 disks, CRT/ keyboards, printers from 100 cps to 600



lpm, magnetic tapes, cassettes, punched card devices and paper tapes. Anything your customer needs. And when his needs change, so can the system. Easily. Even by factors of 2 or 3.

## Complete software tools

To make your programming burden lighter we offer a full set of software tools: Fortran, assemblers, utilities, RTOS, sort/merge, DOS and RPG/SUE. That last item is 98% compatible with RPG II by the way.



And we're the only company we know of that unconditionally warrants all our software for a full year.

# Let's talk.

See SUE systems at the National Computer Conference booth #2831



**Maintenance too** We'll handle any and all problems your customers might have, promptly and expertly, anywhere. (We recently solved a problem in Bangkok, for instance.) And we'll do it by contract or on call, either way you want it.

We also offer training classes in maintenance as well as in programming.

**Add it up** So what you'll have is a more salable package to offer an end user. Everything he'll ever want or need in a minicomputer system, right down to the enclosures. (Which we'll put your name on, if you wish.)

Everything ready and working from the minute it's wheeled in his door.

And you'll be dealing with an established, reputable company. One that will be there when you need us.

Let's talk. Call the number below, collect, or write us at 6201 E. Randolph Street, Los Angeles, California 90040.

**213/722-6810**

**Lockheed**  
**Electronics**

Data Products Division



## Punchy

IBM employee Ann Nemoede sifts through a pile of nearly two million card chips punched from more than 6,500 cards. This testing procedure is used to test each punch unit of the IBM 3525 card punch.

**Would You Believe?**

**3½ cents**

To convert a three line name and address to computer tape

Minimum Quantity —  
40,000

Call or Write  
Jim Feeley

Security Pacific  
National Bank  
Optimization Services

1010 S. Flower  
Los Angeles Ca. 90015  
(213) 749-3171

**New OEM Products**

(While equipment in this column is primarily for Original Equipment Manufacturers (OEMs), in most cases it is also available in single units to interested users.)

Further, while much of this equipment is not presently available as such to the end user, it does give some indication of techniques and products that may be incorporated into end-user equipment.)

**Head Upgrades 2314****To 330 Capability**

GOLETA, Calif. — A disk pack recording head with the ability to upgrade 2314 subsystems to 330 subsystem capability is available from Information Magnetics Corp.

The Model R 4400-NT is primarily designed for use in quadruple density 2314-type and cartridge disk subsystems, writing 200 track/in., with a recording density of 4,400 bit/in.

The read/write head has the same flying height as conventional 2314 heads and writes with a track width of .004 in.

Operating frequencies are 1.25 MHz and 2.5 MHz nominal. Output signal is minimum of 1mV, and resolution exceeds 50%.

Price is around \$500 in low volume OEM quantities from 5735 Thornwood Drive.

**Floppy Disk for Minis Out**

PALO ALTO, Calif. — A minicomputer-compatible floppy disk subsystem is available complete with one drive, controller electronics, computer interface and software from Advanced Electronic Design.

Storage capacity is 262K character/drive with a transfer rate of 31 kchar/sec.

Price is around \$3,000 for a one-drive system with optional extra drives at \$1,000 each from 3197 Park Blvd., 94306.

**Data Display Uses One PCB**

ST. PAUL, Minn. — A 23-in. data display unit, the TD-23, is available from Miratel Division of Ball Brothers Research Corp.

The unit is designed with one solid-state printed circuit board with plug connections to all necessary components. A differential input system is incorporated to minimize hum and extraneous pickup on long cable runs, the firm said.

Additionally, special CRT phosphors and faceplates are available, and TD-23 mounting options include shelf or ceiling yoke hangers.

OEM list price is \$425 with volume discounts available from 1633 Terrace Drive, 55113.

**Tape Controller Fits Novas**

FAIRFAX, Va. — A magnetic tape controller developed for Nova series mini-computer systems is available from C3 Inc.

The controller is constructed on a single printed circuit board which fits into the Nova chassis to provide interfacing and data formatting for up to two Pertec-compatible 9-track, 800 bit/in. tape drives.

The unit can handle speeds of 25-, 37-1/2- and 45 in./sec and provides character parity, character recognition check and longitudinal check on all write and read operations, the firm said.

Other features include read, write, rewind, block skip, erase and search file mark as standard operations.

The controller is priced at \$3,500 in quantities of 10 from 2820 Dorr Ave., 22030.

**Computer Keeps Cool**

CHERRY HILL, N.J. — A.C. Manufacturing Co. has a chilled water cooling system for computer equipment requiring internal cooling.

The system is available in 15hp or 23hp aircooled (glycol) and watercooled systems with computer-compatible compressors, circulating pumps and alarm system.

A.C. Manufacturing Co. is at Old Cuthbert and Deer Roads, 08034.

**One-Pass Variable Forms****Computer Married to Printing Press**

By Michael Weinstein

Of the CW Staff

NIAGARA FALLS, N.Y. — Users with business forms or direct mail applications may benefit from a new technology that involves the first marriage of a computer with an ink jet printer to produce variable data on standard forms as they pass through a specially equipped printing press.

Previous to Moore Business Forms, Inc.'s development of the one-pass capability, variable forms had to pass through the presses twice — once to print the form and once to add variable information such as name, address, etc.

The first application of this new process was the preparation of tax forms for the Midwest region of the Internal Revenue Service. As the forms were printed with basic information at 700 ft/min, personalized information was added by the integrated computer unit before the com-

pleted form came off the press.

The device used to add variable information is built around a Varian minicomputer and an A.B. Dick ink jet printer modified to Moore's specifications.

After the form passes under the ink jet printer, information held on standard computer magnetic tapes is used to direct the printing of 5 by 7 dot matrix characters.

At the current level of development the "Compurite" system is equipped with three print units, each capable of printing five lines of variable information on a maximum of three parts of a form (i.e., a maximum of 15 lines of variable information).

Each line can contain up to 38 dot matrix characters with characters printed in black, red, green or blue. At the present time all characters are printed as capitals.

The impact of this system on the \$3.4 billion direct mail industry is expected to be immense and Moore said to protect its lead-time advantage it would not quote actual operating specifications or prices.

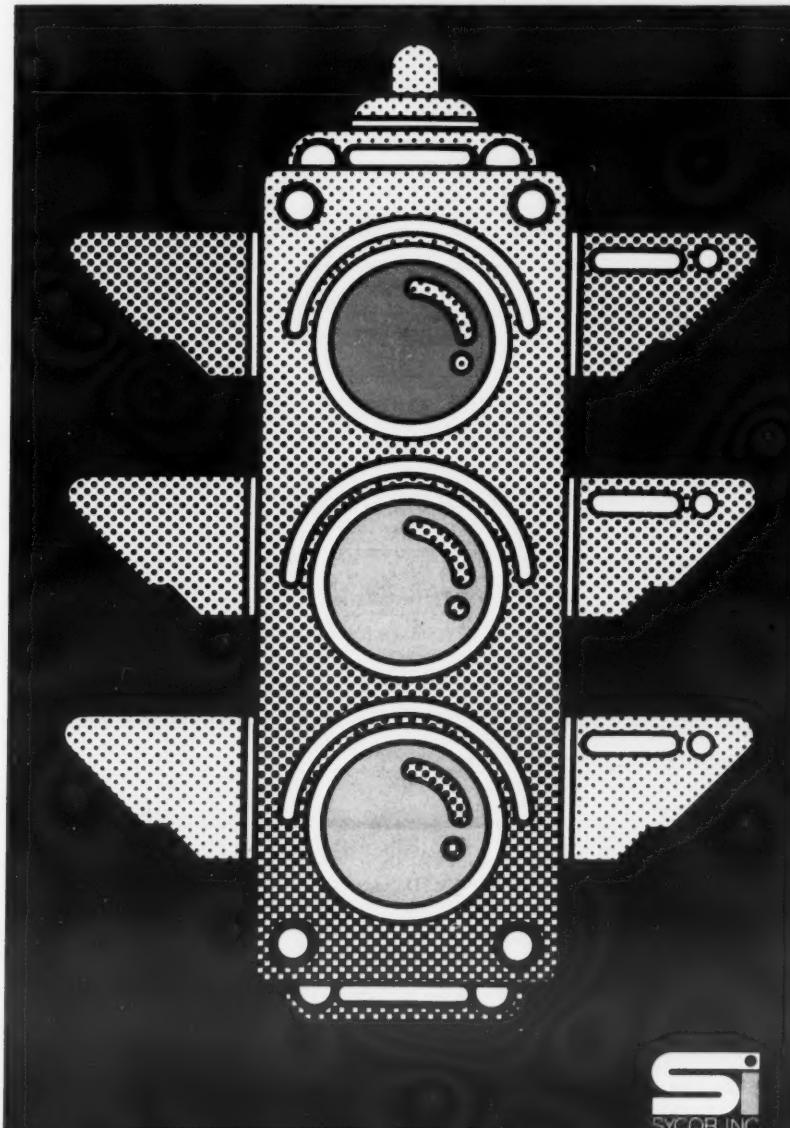
The only way a user can obtain the Compurite capability is on a service bureau basis from Moore. Moore promises full security of users' tapes and will help with any conversion problems of putting information in a format Compurite can read.

The firm is at 900 Buffalo Ave., 14302.

**Report Details System 370**

MOORESTOWN, N.J. — A 60-page Datapro 70 report on the IBM System/370 computer line, including descriptions and analysis of all equipment and software announced by IBM through April 1, 1973, is available at \$15 per copy from One Corporate Center, Route 38.

# OUR INTELLIGENT TERMINAL DOESN'T ALWAYS DO WHAT IT'S TOLD.



Our intelligent communications terminal, the Sycor 340, can be very obstinate.

Like the times an operator inadvertently enters the wrong data.

Perhaps she omits an entry. Or tries to enter a number that doesn't pass the range check.

An alarm buzzes, the keyboard goes dead, and the entry that's incorrect blinks on and off.

Your operator corrects it on the spot. And you save time and money.

And when she's got the clean data ready, the 340 can transmit it unattended at 1200 to 4800 baud speeds.

But clean source data entry isn't the only advantage of an intelligent communications terminal.

The 340's 8K bytes of programmable memory, and our special terminal application language (T.A.L.), make our terminal putty in your hands when it comes to tailoring it for specific applications.

And with capabilities like customized field validation, conditional data entry and arithmetic operations, you've got the tools you need to tackle applications you may not have had in mind when you first leased it.

Our intelligent terminal has some pretty smart peripheral equipment, too. Like remote printing capability from 30 cps to 300 lpm.

Before you lease, check into our intelligent terminal that doesn't always do what it's told. More than 6,000 Sycor terminals are now being used in 33 countries around the globe.

And you'll find a world of uses for them right at home.



**SYCOR**

**Corporate Offices:** Ann Arbor, Michigan 48104 (313) 971-0900. **District Sales Offices:** Atlanta (404) 262-2162 • Boston (617) 890-7290 • Chicago (312) 986-1833 • Cleveland (216) 831-8625 • Dallas (214) 521-6710 • Detroit (313) 522-0080 • Houston (713) 688-5224 • Los Angeles (213) 640-0120 • New York (212) 483-8188 • Philadelphia (609) 665-1170 • Pittsburgh (412) 922-3350 • San Francisco (415) 349-6626 • Washington (703) 525-7300. **In Canada:** Sycor International Ltd., Toronto (416) 429-0883. **Service Centers in 76 cities.**

**Book Describes Microforms**

WASHINGTON, D.C. — Users with applications involving microforms can obtain a publication from the American Society for Information Science (Asis) detailing the state of the art.

The book describes the types of microforms available, and discusses the uses, benefits and drawbacks of various microforms.

*The Invisible Medium: The State of the Art of Microform and a Guide to the Literature* is available from 1140 Connecticut Ave. N.W., Suite 804, 20036 for \$3.50 per copy.

**System/3-Type Disk Packs Available for Mini Users**

TORRANCE, Calif. — System/3-type disk packs are now available from Athana Division of Computer Disc Mastertape Corp., for use with minicomputers utilizing IBM 5440-type drives.

The company claimed the disk coatings were error-free and that the disks carry a standard three-year warranty.

Unit price is \$140 from the firm at P.O. Box 3313, 90510.

**Calculator Prints In Japanese**

PALO ALTO, Calif. — Hewlett-Packard has developed a special memory for its Model 9810A programmable calculator which enables the calculator to print in Katakana, the Japanese phonetic alphabet.

The read-only memory (ROM) block, developed to adapt the calculator to the

ENTER DATA
RETENTION TIME
PERK AREA
WEIGHT
1.0000
43.0000
27550.0000
0.6000

Hewlett-Packard Model 9810A electronic calculator prints out paper tape of user instructions and labeled results in English.

Japanese market, permits the calculator to print Roman characters, numerals and various symbols, as well as the Katakana characters in any combination.

The Katakana ROM block is being offered only in Japan. Price is in the range of \$600 to \$700, depending on the rate of exchange. Hewlett-Packard is at 1501 Page Mill Road, 94304.

テキスト
ホルダ
ヒート
ヒューズ
1.0000
43.0000
27550.0000
0.6000

The Japanese version of the same instructions is printed by the calculator using the Katakana memory block.

**New OEM Products**

(While equipment in this column is primarily for Original Equipment Manufacturers (OEMs), in most cases it is also available in single units to interested users.)

Further, while much of this equipment is not presently available as such to the end user, it does give some indication of techniques and products that may be incorporated into end-user equipment.)

**Impact Printer for Minis**

CHATSWORTH, Calif. — Pertec Corp. has introduced a medium-speed impact printer for use with minicomputers and remote terminals.

The Pertec printer has two print speeds — 160- and 300 line/min.

Printer electronics are designed so that a change from the normal 64-character set to a 48- or 96-character set is automatically sensed.

Other features are vertical spacing selection of 6- or 8 line/in., full fault protection, forms handling and adjusting capabilities and disconnect terminals on the power transformer to provide nominal voltage selection from 95 to 250 Vac.

The printer also has optional, plug-in features such as the 12-channel vertical format unit.

The price is \$3,990 in quantities of 100 or more with delivery in 30 days. Pertec is at 9600 Irondale Ave., 91311.

**Datapoint Joins Centronics Printer**

SEATTLE, Wash. — A plug-in interface which connects a Datapoint 2200 with any Centronics printer is available from Keywrite Corp.

Circuitry is contained on one printed circuit board which fits inside the printer and requires no installation modifications.

Operationally, the interface receives a parallel 8-bit input from the Datapoint 2200 and transmits the data in parallel to the Centronics printer.

Interconnecting cables are available to fit user requirements, the firm said.

Base price of the interface is \$350 with volume discounts available from 1200 N. 107th St., 98133.

**Display Provides 6-Digit Read-Out**

ITASCA, Ill. — A remote display unit, Slimline Remote Display, is available from Nationwide Electronic Systems, Inc.

The unit provides up to six digits of .270 in.-high LED readout from any TTL/DTL source of parallel 1248 positive true BCD data.

Cost ranges from \$149 to \$155, depending on digit-design and digit-requirements. Delivery is about 20 days from 7N662 Route 53, 60143.

**Tape Unit Handles 75 Char./Sec**

CARLSTADT, N.J. — A 75 char./sec paper tape punch has been introduced by Litton ABS OEM Products Division.

Available in desk top or rack mounted models with or without IC electronics, the Roytron 700 Series handles 5-, 6-, 7- or 8-level code.

Features include positive detent stop, tape tear knife, tape hold down, tape drive sprocket, punch cover and timing generator. All units are available with discrete negative logic or positive logic.

Unit price is \$507 with OEM discounts available from 600 Washington Ave., 07072.

**British Punch Available in U.S.**

MIDDLESEX, England — Data Dynamics has announced the availability of its 1130 Series paper tape punches for U.S. OEM buyers.

The 1130 Series operates at speeds of up to 46 char./sec and is offered in either synchronous or asynchronous models.

Other versions include free-standing units with or without tape handling, and options such as echo check, edge punched card perforation, variable tape guide and desk mounting.

Prices for the 1130 units start at \$444 through Data House, Springfield Road, Hayes, Middlesex, England.

**COMPUTER RESOURCE UTILIZATION AND COST CONTROL SYSTEM****CAN YOU MOTIVATE MACHINES TO WORK HARDER?**

No, but—you can motivate the people who use them and operate them, IF you can answer these questions:

- What does my Data Processing workload require: consume?
- How is my equipment being used?
- What are constraints to throughput?
- What are my costs?
- What is my return by device?
- Who is consuming my resources? How much? Do they know it?
- Are standards being followed? Are they optimal?
- What are my software problems?

We can help you get the answers you need!

Provides costs by job. Produces resource utilization reports by:

- Steps
- Job
- Organization Structure
- Computing System

**Report Types are:**

- Record Control Totals
- Error Diagnostics
- Job Audit
- Revenue Analysis
- Graphic plots of Paging: I/O devices: Core utilization; Multiprogramming
- Program Analysis by: Paging Volume; Paging Rate; Abends; excessive use of resources

**Special Accounting Features of DTR:**

- Priority Accounting
- Degradation Accounting
- Differential costing for TSO jobs. HASP/RJE spooling and Special Forms

**IV. RESOURCE BILLING SYSTEM (RBS):** Charging for all computer center resources.**V. DATA INQUIRY SYSTEM (DIS):** The Data Inquiry System (DIS) provides the KOMAND user with a simple information retrieval and reporting capability.**VI. SUPPORT:** Installation support and maintenance are provided.**VII. KOMAND USER BASE:** We have 73 systems installed. These include, 26 manufacturing and service, 20 governmental, and 27 financial organizations. The client base is growing rapidly with 1973 sales running 40% above 1972.

Please Forward:

[ ] KOMAND descriptive material  
 [ ] "Evaluation of Resource Control Systems"

Name \_\_\_\_\_ Title \_\_\_\_\_

Firm \_\_\_\_\_ Phone \_\_\_\_\_

Address \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

CPU \_\_\_\_\_ Op System \_\_\_\_\_

PACE Applied Technology, Inc.  
 1117 North 19th St., Suite 1100  
 Arlington, Virginia 22209  
 (703) 527-4810

**PACE**

**PACE Applied Technology** announces a new Computer Resource Utilization and Cost Control system, **KOMAND**, operating with both VS and OS in the System 360/370 environment. **KOMAND-DAS** (Data Acquisition System) replaces the PACES-DAS which is no longer marketed.

**I. STRUCTURE OF KOMAND:** KOMAND provides management with the information necessary for positive cost performance measurement and control. Modules presently available are; the Data Base Generator (DBG), the Data Reporter (DTR) (these two comprise the **KOMAND-DAS**), the Resource Billing System (RBS), and the Data Inquiry System (DIS).

**II. DATA BASE GENERATOR (DBG)****Records generated:**

- Job Initiation Record — Provides complete accounting information at the start of a job.
- Interval Account Record — Accounts for TP or long-running jobs.
- Mount Account Record
- Records operator activity.
- HASP Writer Record — Provides for SYSPUT spooling activity.
- System Crash Record — Documents system downtime.

**Internal Control Features:**

- HASP/SMF Compatibility — DBG retrieves SMF data lost due to HASP.
- JCL Error Accounting
- Job Account Code Validation
- Wait Time Extension
- Completion Code Validation
- In-Stream Reporting
- SMF Data Recovery

**III. DATA REPORTER (DTR):** Draws on SMF and DBG for a total data base.

## 38 Technical Sessions

## NCR Meeting Features Product Preview

SAN DIEGO, Calif. — NCR users gathering at the annual meeting at the Sheraton Harbor Island Hotel here May 14-16 will get a preview of some future products as well as a selection of 38 technical sessions.

A session on "Taxes on Computer Software" will be given by Joseph Frascella of Systems Development Corp. on May 16.

"Prospective Medicine," a means of identifying potential health problems through the use of the computer, will be discussed by Dr. Charles Roos of Inter-Health. Stephen L. Priest of the Brockton, Mass., Hospital will outline a method of "Using Routine Hospital Data in Administrative Decision-Making."

For those interested in computer operating costs, Dr. Laird Sloan of Automated Systems Corp., Houston, will discuss the "Incremental Costs for an On-Line Data Collection and Communications System."

Representatives from NCR will lead some of the sessions, and William S. Anderson, president, will keynote the opening meeting May 14. Users may also visit the NCR DP division head-

quarters and new manufacturing plant at Rancho Bernardo.

"User Responsibilities" will be discussed by Stephen Loewy,

### Societies/ User Groups

NCR assistant vice-president, systems services, and recent and future trends in software development will be outlined by Wil-

liam P. Keating, NCR assistant vice-president.

Carl Cutright, also of NCR, will explain NCR's computerized inventory management system, and Dave Glick will speak on "optimizing production scheduling."

Attendees will be given a first look at "Documat," NCR's forthcoming computer-assisted documentation system, plus a preview of some future software releases, such as Release 8B.

### Manual Government Systems Unfair, Davis to Tell GMIS Users

JACKSONVILLE, Fla. — Governments that fail to use computer-based systems perform an injustice to the public interest and cannot fulfill their public service obligations, according to Dr. Ruth M. Davis, Director of the National Bureau of Standards, Center for Computer Sciences.

Davis will be expanding on this theme as the keynote speaker for the Government Management Information Systems

(GMIS) Users' Group, at its annual meeting here May 15 and 16.

The GMIS users must assume a large responsibility in bringing automation as a technological partner of good government to the attention of national leaders, she said.

Also scheduled for the meeting are two panel/workshops. The Wednesday session is titled "Project '73 — Administrative Regulations for Security and Confidentiality in State and Local Government Data Centers." It will deal with the issue of shared versus dedicated computer systems.

"Project '74 — Computer Independent Data Management Software" will be the topic for Thursday's session, focusing on the need to accomplish transference of systems.

In addition to the panel/workshops, several sessions dealing with current topics in municipal data processing are scheduled.

Details of the conference can be obtained from Masaji S. Toki, GMIS secretary-treasurer, 138 E. Court St., Cincinnati, Ohio 45202.

### IEEE Sponsors Awards

SILVER SPRING, Md. — The IEEE Computer Society Governing Board has voted to sponsor the awards in Mathematics and Computers at the International Science and Engineering Fair in San Diego, Calif., May 6-12.

In addition to sponsoring the awards, the society will provide judges in the mathematics and computer category.

The society hopes this step will strengthen its present and future student participation.

### Graphics Group to Emphasize MIS, Composition, Mail Applications

TORONTO, Ont. — The seventh annual Graphic Communications Computer Conference May 23-25 offers users in the graphic arts a choice of programs on composition, mailing lists and management information systems using computers. The conference will be at the Sheraton Four Seasons Hotel.

In the composition program, topics range from information storage, retrieval and composi-

tion to conversion to OCR and input integration. Other sessions will examine blue sky in software, time-sharing composition input and data base management and composition.

The MIS section of the conference covers such topics as management information and company growth, production loading, scheduling and control, and maxisystems from minicomputers — a case study.

Sessions on the mailing list services and delivery system developments will look at Canadian and U.S. postal services and their implications in list maintenance. The trend to route sequencing will also be examined.

There will also be several tours of local plants which use computerized lists and composition systems.

For non-members of the Graphic Communications Computer Association the fee for a single registrant is \$150; for members \$100. Discounts for multiple registrants are available. The association is at 1730 N. Lynn St., Arlington, Va. 22209.

Charles W. Bachman of Honeywell is the recipient of the 1973 A.M. Turing Award for his outstanding contributions to data base technology.

Bachman, the inventor of Data Structure Diagrams, has been the principal architect of the Integrated Data Store data base management system.

The award will be presented at the ACM conference in Atlanta, August 27-29.

# The expeditious Univac DCT-500

Again available on short notice. We've more than doubled production on our fast-selling UNIVAC® DCT-500 Data Communication Terminal.

Here are some reasons why the UNIVAC DCT-500 is industry's most wanted hard copy terminal: 30 cps, 132 print positions, computer quality printout, up to 6-part forms.

And along with the UNIVAC DCT-500 you get Sperry Univac support and reliability.

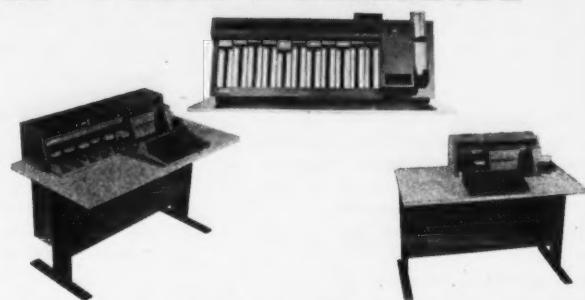
Whatever your data communications requirements, check first with the Sperry Univac Communications and Terminals representative in your area, or call free 800-453-5323.

UNIVAC DCT-500 Data Communication Terminal

**SPERRY + UNIVAC**

Only when our customers succeed do we succeed.

# IT'S ALL IN THE FAMILY



Throughput gains. Reliability. Dollar savings. Versatility. Cost effective solutions to 96 column data preparation problems. All in Decision Data's family — 9601 Data Recorder, 9610 Interpreting Data Recorder, 9660 Sorting Data Recorder, and the 9620 Alphanumeric Sorter.

Select the units you need to match your requirements, just as you configured your system. And since family benefits last as long as you keep your computer, it's important to know that Decision Data gives you a choice. Between machines and suppliers.

**THE FAMILY: 4 SuperMachines from Decision Data.**

 **DECISION DATA®**  
COMPUTER CORPORATION  
100 WITMER ROAD, HORSHAM, PENNA. 19044  
(215) 674-3300 □ TELEX 63-1471

Model 33ASR with dial-up set and complete maintenance service for \$77 per month.



**RCA opens up a new line to "Data-Phone" Teletype\* users**



Now — lease Teletype equipment from RCA for just \$39 per month (send/receive model 33KSR) including maintenance. With dial-up set, only 80¢ a day more!

- Prompt installation and maintenance services by RCA technicians based in over 130 cities.
- Immediate delivery in any quantity from coast-to-coast warehouse network
- Automatic unattended operation
- Built-in dial capability
- Alternate voice communications
- Friction or sprocket (pin) feed

Call or write your local RCA representative about his complete line of data sets, telephone couplers, solid state selectors and multiplexing equipment.

RCA Service Company, A Division of RCA

- CAMDEN, N.J. 08101, Bldg. 204-2, Phone: (609) 779-4129
- PHILADELPHIA, PA. 19145, 3310 South 20th Street Phone: (215) 674-3300 (Pa.), (609) WO 3-2043 (N.J.)
- ATLANTA, GA. 30318, 1778 Marietta Blvd., N.W., Phone: (404) 355-6110
- CLEVELAND, OHIO 44142, 512 W. 161st. Street, Phone: (216) 267-2725
- JERSEY CITY, N.J. 07305, Liberty Industrial Park, 43 Edward J. Hart Rd., Phone: (201) 434-0003 (N.J.), (212) 732-9494 (N.Y.)
- SKOKIE, ILL. 60076, 7620 Gross Point Road, Phone: (312) 965-7550
- DALLAS, TEXAS 75207, 2711 Irving Blvd., Phone: (214) ME 1-8770
- MONTEBELLO, CALIF. 90640, 1501 Beach Street, Phone: (213) 685-3069

\* Registered service mark of AT&T Co.

\*\* Registered Trademark of Teletype Corp.

**RCA**

**EDP Auditors 'Come of Age'**

SANTA MONICA, Calif. — The 1973 EDP Auditors Conference June 7-8 at the Miramar Hotel here, will focus on "EDP Auditing: A Coming of Age."

The meeting will consist of two series of sessions, one on management and the other on technical aspects of auditing.

"EDP Auditing Perspectives: Internal versus External" and "EDP Auditing's Role in the Management Function" are topics scheduled for the management series. Other sessions will deal with personnel selection and training, and the development of standards.

The technical sessions will examine performance measurement techniques, controls in data base and telecommunication environments, and the evaluation of documentation.

Cost for association members is \$45; non-members, \$55. Registration deadline is May 23. For additional details, contact Dick Ryan, EDP Auditors Association, P.O. Box 15562, Los Angeles, 90015.

**Bankers to Examine Systems, Operations**

CHICAGO, Ill. — A wide-ranging program embracing both systems and bank operations has been planned for the 1973 National Operations and Automation Conference sponsored by the American Banking Association. The meeting will be held here June 4-6 at the Palmer House.

In addition to 54 sessions highlighting current bank operations and DP topics, there will be seven workshops, as well as small special interest sessions and opportunities to discuss experiences with others who have the same responsibilities in similar-sized banks.

An in-depth examination of the changing payments system will be provided through a workshop and several special interest sessions.

Session topics range from "what the manager needs to know about future changes in DP technology and techniques for improving systems and programming productivity," to multilevel looks at OCR and COM.

One of the seminars for large banks will examine evaluating automation alternatives — facilities management, joint ventures, correspondent services, service bureau or in-house development.

Virtual memory, application software selection, and lessons learned in the implementation process are topics of other first-day seminars.

Special interest sessions on Monday will treat areas such as COM, large bank customer information files, modularity in applications programs, remote processing, on-line teller terminals, minicomputers and multiprogramming costing.

**Reject Items**

A Tuesday session on reject item processing will evaluate the possible alternatives — OCR, add-on strips and on-line CRTs. Other sessions will examine use of simulation in bank planning, fundamentals of DP planning, data entry and

embezzlement by computer — the extent of the problem, case histories, why it happens and what can be done to combat the problem.

The Wednesday workshop on the change of payments system will cover the reasons for change as well as the nature and implication of current changes.

Other related sessions include a status report on a national payments system covering automated clearinghouses, point-of-sale systems, bank cards, a review of Atlanta's implementation of a regional automated clearinghouse and magnetic tape accompanying clearing checks.

Another Wednesday workshop focuses on "user department relations — the DP manager's Achilles heel." Primary emphasis will be on assessing systems tried in various banks.

In "Scenario-78" attendees will get a look at what banking may be like in five years.

Conference registration fees are \$130 for bankers and \$160 for non-bankers, which includes three luncheons and two evening receptions.

For registration materials, write the meeting registration coordinator, The American Bankers Association, 1120 Connecticut Ave., N.W., Washington, D.C. 20036.

**Users to Review Financial MIS Projects**

NEW YORK — The Society for Management Information Systems' Spring conference will convene at the New York Hilton May 10-11, preceded by preconference workshops on May 9.

Two concurrent workshops will center on financial management information systems and ingredients of successful MIS project management. Emphasis in the financial session will be on the conceptual design of financial information systems for decentralized management.

Conclusions from a study of 20 information systems development projects in 10 large firms will be reviewed in the workshop on successful management.

The fee for the workshops is \$75 for members, \$105 for non-members, who will also receive membership in the society for one year.

During the conference there will be a repeat of two presentations from past annual conferences, the Westinghouse Story and the International Utilities Story.

The conference fee is \$175 for members, \$205 for non-members, which includes annual dues.

The Society for Management Information Systems is at 221 N. LaSalle St., Chicago, Ill. 60601.

**Calendar**

May 13-16, Denver — Association for Systems Management, 1973 International Systems Meeting. Contact: R.B. McCaffrey, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

May 13-17, Boston — International Communications Association Conference. Contact: J.D. Martin, Jr., National Steel Corp., 700 Chatham Center, Pittsburgh, Pa. 15219.

May 14-15, Arlington, Va. — Washington Chapter of Uaide (Users of Automatic Information Display Equipment) Meeting. Contact: Uaide, c/o Data-graphics, 7315 Wisconsin Ave., Bethesda, Md. 20014.

May 31-June 1, London, England — International Exposition for the Mini-computer Industry sponsored by the Polytechnic of Central London. Contact: Lisa Spaducci, Polytechnic of Central London, 115 New Cavendish St., London W1M 8JS, England.

**TRYING TO REACH THE EDP MARKET?????**

**Selling computers?**

**Marketing software packages?**

**Selling Supplies?**

**Selling terminals?**

COMPUTER '72 will provide you with leads . . . accurate leads to where the computers are.

COMPUTERS '72 will tell you who has purchased fourth generation equipment; where Systems 3 installations have been made and what companies have installed scanners, digital display, key/tape, key disk and more.

COMPUTERS '72 is a series of seven separate directories covering the following geographic areas:

Northern California  
Southern California  
Pacific Northwest (Wash., Oregon, Idaho, Utah, Nevada and Arizona)  
New York City  
New England  
New Jersey and Long Island  
Connecticut and Southern New York (not including NYC)

COMPUTERS '72 provides the name and address of the site, the person who buys, a site description and a telephone number, all in convenient paperback format.

Published by KLH Associates

I have included my check   
Or purchase order   
For COMPUTERS '72 of  
Northern California   
Southern California   
Pacific Northwest   
New York City   
New England   
New Jersey and Long Island   
Connecticut and Southern New York

1 or 2 copies	\$30/book
3,4,5 copies	\$25/book
6 or more	\$20/book
2 of same book	\$25 each
3 or 4 of same book	\$20 each
5 or more of same book	\$17.50 each

(No directories mailed without check or purchase order)

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Telephone No. \_\_\_\_\_

**CW Associates**  
P.O. Box 144  
Babson Park, Mass. 02157  
Tel. (617) 969-4640

**Limited Copies Remaining — Order Now!!**

## Multimedia Instruction Plan Features Self-Determined Pace

WELLESLEY HILLS, Mass. — Multimedia instruction in data processing is now available for individual learning through a self-instruction package from Honeywell Information Systems.

This package combines programmed texts and flipbooks with film strips and cassette tapes and is called the "Self-Instructional System of the Seventies."

The basic course material is essentially generic, and the knowledge acquired can be used with any computer, according to Honeywell.

The learning programs are designed to educate the data processing trainee in the basic concepts of computer programming on an individual basis. Although they require no instructor assistance other than exam grading, administrative guides are provided to help implement the program in schools, colleges and corporations.

Each student may begin a course at any time and proceeds at his own pace in an interactive environment involving reading, listening, observing, responding and viewing. Programmer training requires from 120 to 150 hours of learning on a full-time study basis.

At the end of each course the student is tested and evaluated against national standards on his understanding of the material.

### DP Goes to Church

NEW DUNDEE, Ont. — A Lutheran pastor sees the computer as "one of God's little helpers" for its capacities as financial advisor. The St. James Lutheran Church here is leasing a computer which lets the church council know if monthly budgets are being met and also gives each member a statement of his yearly contributions for tax purposes.

## Education

visual aids and instructs the student in their use. These aids include film strips, audio cassettes and, for some courses, flipbooks. The administrator then monitors student progress and grades progress examinations.

The eight self-instruction programs now available are Fundamentals of Electronic Data Processing, Programming Logic, Basic Cobol, Tape Cobol, Disk Concepts, Disk Cobol, Advanced Cobol and Introduction to Series 200/2000.

Two data-entry courses are also offered for Keytape and Keyplex Operator Training. The data entry courses contain texts and audio cassettes designed for use at Keytape or Keyplex machine stations that provide hands-on experience during training.

Cost of the administrator's kits range from \$95 to \$195. The student texts range from \$7.50 to \$22.50.

The audio-visual hardware unit for a one-time purchase price of \$195, includes a self-contained, rear-screen film strip projector and audio tape cassette player. The audio system has a built-in speaker for group listening and a jack for use with the hi-fi type headphones for private listening. The number of units required is determined by the number of students using the system at one specific time.

The Honeywell education center is located at 110 Cedar St., 02181.



**When your data transmission goes down, you don't want excuses.**

**You want that fault fixed. Fast.**

### Here's how to do it.

Faults in your data communication system, modem and line are automatically identified faster with Antekna's new Model 221 than any other means. We call it the Fault Fixer. Because it fixes responsibility where it belongs within seconds of a data interrupt. Automatically.

And that cuts your downtime down.

In fact, it cuts it down by so much that our calculations show the Model 221 returns its investment within the first few operational months. It's system transparent, operates point-to-point synchronous, provides diagnostic reports on error rates as well as faults — and requires no local or remote operator.

That means you can permanently install the Model 221. There's no connecting and disconnecting cables for tests as is the case with other units.

That's quite a package. Particularly when you figure it quickly pays your money back by keeping your system up. Plus it ends

**The Fault Fixer**



Clip this coupon to your letterhead and mail for more information.

Name \_\_\_\_\_

Title \_\_\_\_\_

Phone \_\_\_\_\_

Check one:  My need is immediate

Within 3 to 6 months  Reference

Antekna, Data Comm Division; 625 Clyde Avenue, Mountain View, CA 94040



Data processing trainee progresses at her own pace using programmed text and audio-visual self instructional system developed by Honeywell.

## Control Data Graduates Qualify for College Credit

MINNEAPOLIS — Computer technology graduates of Control Data Institute will be able to apply their training towards a degree at St. Cloud (Minn.) State College under terms of an agreement just completed by the college and the institute.

Institute graduates will be able to transfer as much as 30 quarter hours of credit to the electromechanical technology program in the college's School of Industry, according to Dr. Robert Ryan, chairman of St. Cloud's technology department.

## Drake University To Offer Major In DP Management

DES MOINES, Iowa — Drake University will offer an undergraduate major in computer information systems management through its College of Business Administration, beginning next fall. One objective of the new curriculum is to prepare students for the Certificate in Data Processing (CDP) examinations sponsored by the Data Processing Management Association.

### Management Studies Included

The new program is principally intended to get students ready for positions in DP management and systems analysis. It tempers classic computer science courses with studies in principles of management, and systems analysis and design so that graduates will have an appreciation of business problems as well as DP.

While the new program is the first at Drake to focus principally on DP, students in all curricula run by the College of Business Administration have been required to take at least an introductory course in DP. The school even grants "foreign language" credits for work done in Cobol or Fortran, a spokesman noted.

The university has a Honeywell H1200 which is available for student use.

# vardon

NOW—THESE  
IMPORTANT NEW  
DATA TERMINALS  
.. FROM VARDON

**di'an**

**SERIES 9030  
TELEPRINTER**

**Datapoint  
3300**  
COMPUTER TERMINAL

**TELERAY  
3300**  
TELETYPE 33 REPLACEMENT

**TELETYPE  
SYSTEMS**

**PLUS OUR WELL KNOWN LINES  
OF FULLY RECONDITIONED AND  
GUARANTEED EQUIPMENT**

**For prompt attention  
to your EDP  
requirements, call**

**AC 214/252-7502**



**vardon  
& associates. inc.**

930 N. Beltline Suite 140 Irving, Texas 75062

## DP Diagnosis Debugs 'the Bug'

Volkswagen of America has turned to computers to get the bugs out of "the bug."

Computer Diagnosis, the car dealer's check-up system, uses sensors built into all late-model VWs to make up to 72 checks on a car's performance. These include such tasks as checking front-wheel alignment, ignition performance, engine compression and the electrical system.

To perform the checks a digital system designed by Siemens A.G. of Germany is connected to a central socket in the engine compartment. A program card runs the tests in sequence and results are analyzed and printed out in 20 minutes.

Under a services and maintenance contract with Honeywell's Test Instruments Division, the system is being installed at 12,000 VW dealers.

By Bob Wright

Of the CW Staff

SALEM, Ore. — An unusual concept coupling specialized teams with computer-assisted operation has resulted in increased efficiency and better control for the Oregon State Accident Insurance Fund (Saif).

Used in Saif's claims operations, the Claims Director System (CDS) calls for a team-specialist approach to speed the handling of workmen's compensation cases. The team includes an employment specialist, insurance-legal specialist, medical specialist, computer data control clerk and unit clerk.

### Divided Workload

Before CDS was in operation, each claims adjuster was responsible for controlling all of the aspects associated with a claim. The CDS concept, by dividing the total workload, allows the adjuster to concentrate his attention and effort on the claimant.

Ralph Faulkner, DP manager for Saif,

explained that the organizational structure around the hardware and software enables CDS to spot rehabilitation needs and anticipate problems that could later complicate a claimant's recovery. "The payoff," Faulkner added, "is in getting the man back to work earlier."

Through faster and more personal claim service, CDS also reduces the chances for psychological barriers to develop which interfere with a worker's rehabilitation.

CDS uses a customized Nova 1220 with two disk drives, one for programs and

claimant records and another for backup. Faulkner said the Nova, hardware to drive the CRT display, and the software were all developed by Insurance Technology Inc., Berkeley, Calif. A 150 char/sec printer completes the system.

Faulkner noted that CDS can realistically handle 1,300 to 1,400 claims, although the stated capacity is 2,000. "Cost," Faulkner added, "is about \$50,000 annually, which includes hardware, software, concepts, techniques and training."

## Checkless Society 'Here Now'

COLUMBUS, Ohio — Money is a thing of the past — at least for some residents of this city.

After a nine-month experiment City National Bank & Trust Co. is now installing a computer system which will allow its customers throughout the area to buy virtually anything with a single credit card.

A checkless system has been tried before in other cities, but at least one founded in part through lack of customers. This problem does not seem to affect the Ohio scheme — thirty businesses, including supermarkets, pharmacies and department stores, have signed up to participate.

Store terminals are linked by phone lines to a master computer at the bank, permitting the salesman to verify and record a sale in seconds. Customers have the option of charging the merchandise and being billed at a later date, or of paying for it directly from their checking accounts.

The checkless system cuts down on paperwork for the bank, and protects the store since the computer rejects the sale if the customer has insufficient funds or if the card is stolen.

"Everyone has talked about a checkless, cashless society," says bank chairman John G. McCoy. "They said it would be here 10 years from now. We think it's here today."

## Ace Bill Collector Gets the Alimony

PORTLAND, Ore. — Harold C. Hart is Oregon's No. 1 bill collector. And what he collects are overdue payments of alimony and child support.

Aided by his computer, Hart, working for the district attorney, collected \$10.9 million last year alone. His "victims" are the delinquent among the 19,000 fathers whose names spin in the Multnomah County computer file.

All child support and alimony orders are stored in the computer and a bill is automatically sent out to the father. If no payment is received within 30 days of the due date, the computer sends out a reminder note and waits 30 more days. Then, if the account is still unpaid, the computer marks the case for prosecution.

Last year, some 210 "founding" fathers were "turned in" by the computer.

### 'But Ours Are Cuter'

BIRMINGHAM, Ala. — Personalizing computers may be a big problem for some banks, but not for the First State Bank of Altoona. In fact, they boast not only personalized service, but advertise "cuter" computers.

The secret of their service is indeed personalized computers — two women who do all the bookkeeping.

"It's just not economically feasible for us to have computers now," says Jack Ray, bank president. "We have little or no turnover in personnel, so our bookkeepers know the customers, their habits and their technique of banking."

The fact that some First State customers sign their checks with an "X" probably has a lot to do with it too, he said.

### Aussies May Store Legal Data

CANBERRA, Australia — The Federal Government has set up a committee to examine the use of computers to store legal information. The government hopes to transfer all legal data on federal statutes to computers to make information more readily available.

# Judge us by the companies we keep.

When you are good at what you do, you want people to know about it. But when you are competing with over a hundred timesharing companies you are tempted to exaggerate in order to get attention.

We're going to resist the urge.

Com-Share helps people control information. We use computer technology and a lot of personal attention to do it. And imagination.

We also put a lot into making electronic data processing more usable for the person with the most at stake: You.

### Do we really make the computer make sense?

Ask General Motors.

Ask Motorola.

Ask Monsanto.

Ask New York Telephone.

Ask Twentieth Century Fox.

Ask A.B. Dick.

Ask Crown Zellerbach.

Ask Missouri Pacific.

Ask NASA.

**COM  
SHARE**  
TECHNOLOGY

making the computer make sense

**Corporate Headquarters:** Ann Arbor, Michigan Phone: (313) 761-4040 / **OFFICES:** Atlanta, Boston, New York, Philadelphia, Pittsburgh, Washington D.C., Detroit, Chicago, Cleveland, Cincinnati, Houston, Minneapolis, St. Louis, San Francisco, Los Angeles, Toronto, London, Ottawa, Montreal, London (England), Birmingham (England), Wakefield (England)

# COMPUTER INDUSTRY

## CI Notes

### Cary Sees Business Up

SEATTLE, Wash. — IBM is expecting improved business this year, President Frank T. Cary told shareholders at the recent annual meeting. "We expect relatively strong economic conditions in virtually all major countries," he said.

The firm plans to hire about 20,000 persons this year, half of whom will be based abroad, he said.

At the meeting, stockholders approved a five-for-four stock split.

Shipments of DP equipment for the year "are expected to be at a high level, with several newly announced System 370 products scheduled to be delivered in increasing quantities as the year progresses," Cary said.

### Comma, CHCS May Merge

NEWTOWN, Pa. — A merger may be in the offing for Comma Corp. and Computer Hardware Consultants & Services, Inc.

The boards of directors of both firms have approved an agreement providing for the merger.

### DPF to Replace Air Force 360s

HARTSDALE, N.Y. — DPF Inc. has received a contract from the Air Force to replace six IBM 360/40s, 75 IBM 2400 tape drives and other equipment, with a total IBM purchase price of about \$5 million.

Under a previous award, DPF will also supply the Air Force with a 360/75.

### Supershorts

The Social Security Administration has ordered 70 1302 key-to-disk systems from Inforex, Inc., for a total of 851 keystations. The units will be delivered this year, according to Inforex. The contract allows the government to increase the total order by about 50%, the firm added.

Peripheral Sciences, Inc. has named Dasa Corp. as sales and service representative in the major metropolitan areas of the U.S.

Applied Data Research, Inc. has established ADR International Corp. as a wholly owned subsidiary to direct the firm's growing world trade activities.

Advanced Memory Systems, Inc. has received a contract from Telefunken Computer GmbH of W. Germany for the design and manufacture of 128K word by 59 bit MOS memory systems. Telefunken will convert its Model 440 computer from core to MOS memory with shipments starting this fall.

Brother International Corp. recently delivered the 10,000th printer assembly to Centronics Data Corp.



### Documents Indicate:

## IBM Studied Profits, Discounts on FTP

By E. Drake Lundell Jr.

Of the CW Staff

TULSA, Okla. — IBM almost gave its users a larger discount on equipment when it announced the fixed-term lease plan, but apparently the larger discount was unacceptable to the firm's lawyers and economists, according to confidential IBM documents released here.

It also appears from the documents that IBM carefully planned in May, 1971, which devices would receive the price reductions and which would not.

IBM's data processing group initially recommended a 10% reduction for 12-month leases and a 20% discount for the 24-month lease plans.

At the same time, the firm's lawyers recommended a plan that would give users a 10% discount for an 18-month lease and a 20% cut if the user would sign up for 30 months.

It was determined, the documents showed, that the "convergence point" of the two plans would be an 8% discount for a 12-month lease and a 16% discount for the two-year leases — and that was the plan that was finally announced.

### Only Certain Products

In the briefing plan drawn up on May 18, 1971, just about a month before the plan was announced publicly, there were lists indicating which products would be

in the plan and which would not.

The documents show IBM originally planned to reduce lease prices on all printers, tape units and controllers, and disk drives and controllers.

No reason was given in the briefing plan for excluding certain products, but testimony in the Telex-IBM case indicated that the products included in the plan were those with competition from independents, and the ones left on the 30-day lease plan were those that had no competition.

The documents seem to support this contention. The documents show for example, that IBM charted where the reductions would place its equipment in comparison with what else was available in the market.

In the area of three-spindle 2314 configurations, IBM noted that its present price was \$2,480/mo compared with the plug-compatible manufacturers' average price of \$2,260/mo.

The reduction for a one-year lease brought the IBM price down to \$2,282 monthly, while the two-year 16% reduction lowered the price further to \$2,083/mo, under the competition.

### Long-Term Benefits

IBM also charted the effect of the fixed-term plan on its own revenues before going ahead with it and found it would be

## Exhibitors Cite Caravan /73 Sales

By a CW Staff Writer

NEWTON, Mass. — "Based on a 40% increase in exhibitors and a 50% increase in attendance," said Neal Wilder, sales and marketing director for the Computer Caravan/73, "we expect the exhibitors will double last year's sales total of \$25 million." The Caravan recently completed its nationwide 10-city tour.

A random sampling of the 52 exhibiting companies confirmed Wilder's expectations, with most of the firms claiming the investment in the Caravan had been cost-justified before the tour was one-third complete.

John Cullinane, the president of the software firm that bears his name, said one sale justified his expenditure of the \$15,000 for a single booth.

Cullinane is the software representative on the Caravan Advisory Panel, a seven-member group established early this year to help plan the user forums, select sites and cities, and promote the entire program.

Other members include representatives from Iomec, Inc., General Computer Systems, Lockheed Electronics, Univac, ICC/Milgo and Ampex.

Avery Blake, vice-president of marketing for Iomec, noted his firm had a \$7,000 sale within a half hour after the

show opened in Boston."

Dallas Talley, vice-president of marketing for General Computer Systems, noted his firm had a \$150,000 sale to a user who never heard of us.

Many of the exhibitors sent representatives to sit in on the panel discussions and workshops, to "hear what users are doing, and their attitudes, and/or evaluations of that which they have experienced," according to a supervisor for AT&T.

## CDC Splits DP Into 3 Companies

MINNEAPOLIS, Minn. — In a realignment of management, Control Data Corp. has split its computer operations into three separate companies within the corporation.

The move places operating responsibilities with a seven-member management committee, Chairman William C. Norris explained.

The firms are: Control Data Systems & Services Co., Control Data Peripherals Products Co. and Control Data Marketing Co.

The new president of the units are: Robert M. Price, Thomas G. Kamp and Paul G. Miller, respectively, who were formerly senior vice-presidents. Each will be a member of the new management

beneficial in the long run.

In the disk area, for example, the IBM plan estimated that during the 1971-76 time span the fixed-term plan would generate additional revenues of \$52.1 million on the 2314/2319 type of disk drives by preventing that many from going to the competition.

IBM also estimated it would lose \$17.1 million over the same time period, by applying the plan to 2311s, but this would more than be made up by additional revenues of \$57.2 million expected from long-term leases for the 3330 unit.

So while the firm estimated the plan's effects would cost it some revenues in 1971 and 1972 before the 3330 was on the market, the researchers said over the long run the firm would pick up \$61.9 million on the disk line more than it would have without the plan, apparently because it would keep users in the IBM fold who normally would have gone to the independent devices.

In the card equipment area, however, the analysis turned up long-term losses instead of gains if the fixed-term lease was applied. The researchers found IBM would lose revenues of \$106.2 million if the plan was applied to the 2540 card reader/punch and to other System 360 I/O gear over the 1971-76 time span.

In addition the firm estimated the profitability of the 3505 Card Reader/Punch and the 3525 Controller would slip from 25.1% of revenues to only 18.9% of revenues if the fixed-term plan were applied to the card I/O gear.

However, the firm might have a surprise in store for card equipment users since the report noted IBM "could do a card I/O price increase on own merit regardless of FTP."

In addition, the researchers said the firm should not "do FTP on System/3 I/O gear" because of profitability reasons and because such a long-term "lease" plan in the System/3 area might "slow migration within the system."

## 1400 PROGRAMS STILL PICKING YOUR POCKETS?

Save time, core and rent with INSCO/CS 1400 Translator. This unique proprietary system has already converted over 1000 programs from Object to COBOL. Typical results: 360/40 DOS with disk programs—35% time savings; 370/155 OS tape programs—3 times faster using 1/3 the core.

Besides these everyday savings, INSCO/CS Translator helps you get back the most on your original 1400 program investment. It rescues your programmers from the drudgery of second generation languages. And it eliminates costly patching, emulation and simulation forever.

Why postpone the inevitable? Send today for our free brochure "The Better Way" or call Bob Russo: 212-553-8544.

INSCO/CS Translator  
12 Gold Street  
Box 101  
New York, N.Y. 10038

Send me "The Better Way".  
 Prove it to me.

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City, State & Zip \_\_\_\_\_

INSCO/CS

**Survey Indicates****Communications Industry Should Help Educate User**

By Molly Upton  
Of the CW Staff

KANSAS CITY, Mo. — Communications users and industry representatives agreed in a recent survey here that more education and delineation of communications capabilities and foibles are needed in order to advance the level of communications use.

"The industry should be more responsive to the user and provide the facilities he needs," commented Dick Fioretto of Panhandle Eastern Pipe Line.

He observed that the communications capabilities of the dial-up networks should be improved, and said users need more economical systems. Perhaps a dedicated system throughout the country would provide this, he added.

**Who Should Help?**

"Users need help, but I'm not sure it should necessarily come from the indus-

try," commented Dave Nordlund of the University of Kansas. "Users need a good handle on the kind of service that will supply their needs."

For example, he said, they need more information on data rates, code sets and



Dick Fioretto

how to assess their future equipment needs.

"Perhaps some sort of book is needed detailing theoretical case histories involving selection of equipment for particular needs," he observed.

"Users need to prime their intuition. Some aspects are not obvious. For instance," he pointed out, "the most economical units may be inadequate for the system when it is upgraded."

"There are too many factors in selection and use. It's like raising a kid. You often don't know if you've made a mistake until it's too late."

**More Comparisons**

George Plofkin, a programmer for the Omaha Public Power District, said he would like to see more comparisons of specifications such as transmission speed.

Plofkin is a time-sharing user and he said he thought T/S firms should publish



Dave Nordlund

throughput specifications.

"Right now a user feels like he's facing a used car salesman" when talking with vendors of different systems, he said. "It's very hard to evaluate them," he added.

From the industry side, John Roush, central regional accounts executive for ICC-Milgo, said, "The industry should educate the user more," and should offer



Bob Smith

reliable equipment and service.

In addition, equipment should be built with "increased diagnostic capabilities of hardware of all types," he said. There should be more schools and seminars informing users about the various communications facilities and characteristics, he added.

Alan G. Melkerson, midwest regional manager of Penril Data Communications, agreed there is a need for more diagnostics in equipment to help stop the finger-pointing between the user and various suppliers.

Bob Smith, sales manager for OEM products, Paradyne, said manufacturers should put more of the communications controlling functions out of the realm of the CPU and put in a "smart box," which would "relieve the user from having DP do functions which can and should be done outside," he said.

Many users currently depend on DP for error control integrity and statistical control, whereas these functions should be performed by a piece of communications gear, he said.

**Adapso Management Meeting Focuses on Profitability**

NEW ORLEANS — "An Environment of Profit — Now and Tomorrow" is the theme of the 38th annual Adapso Management Conference which will be held here June 21-22 at the Royal Sonesta Hotel.

General sessions and workshops will cover topics ranging from network information systems and data communications to the latest techniques in programming for data centers. The question of "Leasing versus Purchasing" will also be covered.

Concurrent Adapso/Software Industry Association sessions will feature discussions on the future of software, the organization of a software company and important issues facing the industry.

For further information contact Adapso, 551 Fifth Ave., New York, N.Y. 10017.

**Think  
Multimedia Data Entry**

KeyScan™ is a shared-processor, key/disk scanning system designed from the ground up, with the latest technology, to be the first high-performance, moderately priced multimedia data entry system.

And that's a lot. It not only means scanning any or all of the common OCR fonts, OMR codes, holes, E13B magnetically and optically, but also the most advanced key/disk data entry system available today. KeyScan also reads small tags and has the capability to sort documents when required.

But that's not all. It can be just what you want it to be: a stand-alone key/disk system, an off-line print station, remote MICR terminal . . . whatever you need.

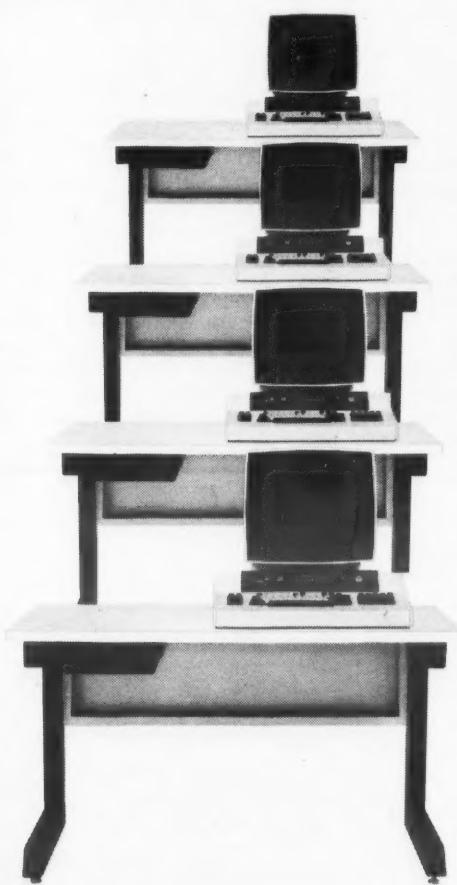
And, as your requirements change, you can

800 Waukegan Road, Glenview, IL 60025 • 312/724-8000

**CUMMINS**  
CUMMINS-ALLISON CORP.



**4400**  
KeyScan Multimedia Data Entry System



# Genesis One Aims at System/3 Peripherals Market

By E. Drake Lundell Jr.

Of the CW Staff

**Wanted:** Firm manufacturing electromechanical peripherals for System/3 that needs national end-user marketing. Also looking for similar terminal makers.

**NEW YORK** — That ad or anything similar has never appeared anywhere and most likely will not. But it expresses the program underway at Genesis One here fairly succinctly: The national marketing organization is actively seeking new companies to represent and is particularly interested in the System/3 peripherals area and in the terminal business.

Myron Angier, president of the firm, noted that the more than 15,000 S/3 users have very few sources for peripheral equipment and therefore are unable to obtain the savings often possible through the use of independently manufactured peripherals.

He said one of the major reasons holding back development in this area is the

fact that there are not really that many engineers around capable of developing the low-end electromechanical peripheral equipment.

"Ninety-eight percent of the engineers in the business are working solely on electronic equipment. What we're looking

## Company Profile

for is a firm made up of the other 2% of the engineers in the business."

He noted it would be difficult for a smaller engineering-oriented firm to market "small ticket" items like peripherals for S/3s and to finance them over as long a lease period as would be necessary.

But, Angier noted, if a firm had the marketing arm it could probably get the lease financing in today's money market. And, needless to say that is where Genesis One could come in, he said.

The firm already has a national sales force and sells equipment made by several different manufacturers, so it could

handle lower-ticket items because the selling cost of each item would be spread out across the entire line of equipment the salesman is handling.

In addition, turning to an independent organization for marketing would prevent a lot of headaches for the small manufacturer, he said, and would allow him to reach the market faster than would be possible if he had to set up an organization from scratch.

## Easier Than 360s?

"Penetrating the System/3 market," Angier predicted, "will be at least as easy, if not easier than penetrating the 360 market."

This is because the S/3 is basically a less sophisticated system and so the users should not have to worry as much about the possibility of degrading performance if foreign equipment is added.

In addition, a great deal of the S/3 equipment market would be in off-line peripherals, such as card equipment, he noted.

The marketing would have to be completely on a replacement basis, he noted, meaning IBM would install a complete system and the user would gain some experience with it before thinking about turning to outside sources.

Genesis One has been actively looking for firms that are established in the area, he said, but have not found any as yet. However, he noted, there is a possibility that Japanese firms or other foreign producers might have this capability.

In addition, Angier said, the firm is looking at other large growth areas in the computer business in hopes of finding firms that want national end-user marketing and he noted the area of communications terminals, particularly intelligent terminals.

Basically, Genesis One is looking for firms that have proven they can manufacture a product and which probably have sold products in the OEM market for a while, but which are now eyeing the more lucrative end-user market.

## Foreign Orders & Installations

The Banque de Paris et des Pays-Bas, S.A., Switzerland, has ordered a Model 6030 system from Honeywell, for operation of private accounts and traditional banking applications.

Nomura Securities Co. Ltd., Japan, has ordered a Univac 1110 to be used as the center of an integrated information complex.

The Caisse Regionale de Credit Agricole Mutuel, a bank in Puy-de-Dome, France, has ordered a Honeywell Series 6000.

The First National City Bank has ordered 100 NCR 399 computers for installation in 22 countries, including Lebanon, Malaysia and Ecuador. The systems will be used to automate the back-office processing of demand-deposit accounts.

The National Iranian Oil Company is installing twin Westinghouse 2500 computers on the Ahwaz-Rey Second Crude Oil pipeline, for use in a supervisory control system.

The French Postal Ministry has ordered a second Postal Address Reader-Indexer System (Paris) from Recognition Equipment France, S.A.

Three Japanese banks, the Osaka Bank of Osaka, the Kyoto Chuo Credit Bank of Kyoto and the Oji Credit Bank of Tokyo, have ordered a total of seven NCR Century 300 systems to monitor installment loans and deposits and to process accounts.

Keio University in Tokyo, Japan, has ordered a Univac 1106 computer system for use in research programs, administration and computer science courses.

Fiducia GmbH, a German data processing center serving a conglomerate of banks, has ordered nine Pertec 3700 computer-output-microfilm systems from Agfa-Gevaert, Pertec Corp.'s European representative.

The National Institute for Nuclear and Particles Physics at the University of Paris has ordered two Cyber 70 Model 72 systems from Control Data Corp. The systems will aid in processing data gathered from scanning devices which photograph vapor paths in bubble chambers.

Zenkyoren, a Japanese concern which handles insurance for agricultural communities, has installed a Univac 1110 system for use in processing policies and statistical work.

The Central Computer Agency in the United Kingdom has ordered a Univac 1106 system to be used by the central statistical office for economic forecasting and research.

**YOU CAN GET  
THE BEST AUDIO-VISUAL  
EDP TRAINING SYSTEM  
FROM CONTROL DATA  
OR McGRAW-HILL.**

**THEY GET IT FROM  
EDUTRONICS.**

Edutronics is the leading producer of audio-visual systems for training of EDP professionals. In fact, thousands of people—from programmers through top management have learned how to use EDP more effectively because of our films, tapes, study guides, workbooks and other materials.

So it's not very surprising that two of the largest educational companies in the world—CONTROL DATA CORPORATION and McGRAW-HILL—selected the EDUTRONICS system as an important element in their own product lines. They both have the resources to produce good audio-visual training materials. But why 're-invent the wheel' when the best is already available. From EDUTRONICS.

If you're in industry and presently looking for a way to improve internal communications, especially within the data processing department, check out the EDUTRONICS TOTAL SYSTEMS APPROACH. We have more than 300 lessons with messages people won't forget. They're grouped into modular courses, covering everything from fundamental computer concepts to sophisticated techniques and applications. The result is something for everyone, regardless of specialization, corporate position or economic justification.

If you're in a school or a college, you should get it from McGraw-Hill.

If you're in business or industry, get it from Control Data . . . or us. EDUTRONICS!

**Edutronics**  
systems international, inc.

Lakeside Office Park, Wakefield, Mass. 01880  
(617) 246-0914

Offices in Los Angeles, New York, Chicago, Kansas City, Boston, Toronto, Paris, London and other principal cities.

A Subsidiary of Coleman  American Companies, Inc.

# The serendipitous Univac DCT-500

Again available on short notice. We've more than doubled production on our fast-selling UNIVAC® DCT-500 Data Communication Terminal.

Here are some reasons why the UNIVAC DCT-500 is industry's most wanted hard copy terminal: 30 cps, 132 print positions, computer quality printout, up to 6-part forms.

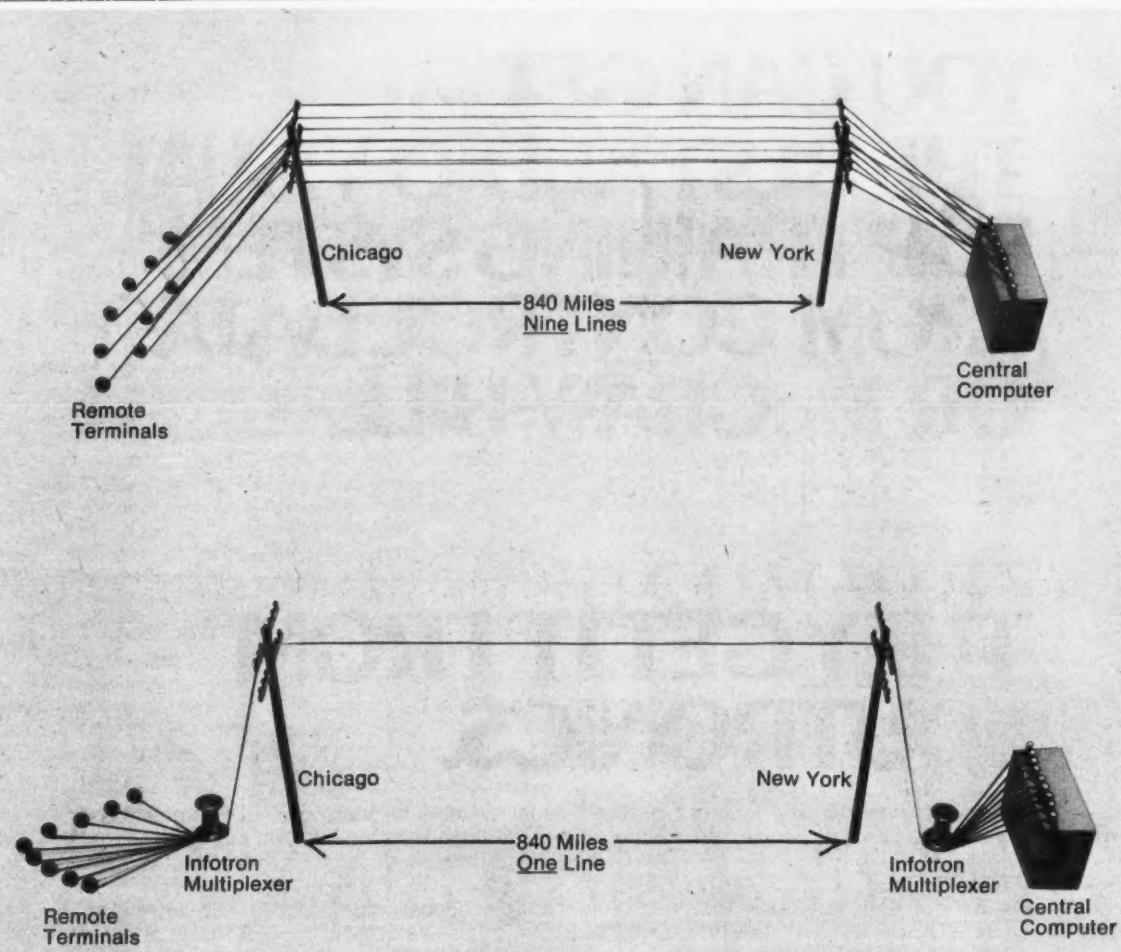
And along with the UNIVAC DCT-500 you get Sperry Univac support and reliability.

Whatever your data communications requirements, check first with the Sperry Univac Communications and Terminals representative in your area, or call free 800-453-5323.

UNIVAC DCT-500 Data Communication Terminal

**SPERRY + UNIVAC**

Only when our customers succeed do we succeed.



## We'll give you 30 days to find out which data communications system costs less.

On the face of it, that may not seem like much of a challenge.

Just count the leased long lines and you're done: nine leased lines will always cost more than one.

In the actual example that we based our illustration on, they cost exactly \$5,410.06 a month more—even allowing for the lease costs of our equipment.

Time Division multiplexers: the efficient, least expensive way to fill a leased line with more data than Alexander Graham What's His Name ever dreamed of.

Which brings us back to our challenge: it's not a challenge. It's an offer.

A very straightforward offer: we'll come in, review your requirements, design a

system and propose the system to you.

If our proposal makes sense to you—order the system. But, make your order subject to cancellation during the first 30 days after we install.

Sound fair? Or better than fair? Drop us a line and we'll call to set up an appointment.

**Infotron Systems**

Infotron Systems Corporation / 7300 N. Crescent Boulevard, Pennsauken, N.J. 08110 / (609) 665-3864

## Semiconductor Memories May Increase Market Share

By Molly Upton

Of the CW Staff

NEW YORK — The U.S. independent memory market is expected to grow from \$445 million in 1972 to \$598 million in 1976, and the semiconductor portion of this market will jump from \$55 million to \$148 million, Dr. Thomas A. Longo of Fairchild Semiconductor Components Group told a recent meeting of analysts here.

The trend towards more memory in computer systems is evidenced by the 10% to 15% annual growth rate in the industry, while the memory segment is achieving a 15% to 25% increase, he said.

The use of semiconductors is "increasing much more rapidly because they are displacing other forms of memory such as core," he observed.

The disk/drum segment of the market will continue to grow, he said, from \$240 million in 1972 to \$370 million in 1976. The core sector, however, will decline to almost half, from \$150 million in 1972 to \$80 million in 1976, he predicted.

By 1976, Longo said he expects the total number of bits of information installed in computer systems will be four times greater than today, with both main memory and mass storage growing at nearly the same rate.

"In main memory, cores are expected to double in volume, while semiconductors are expected to increase by a factor of 10," he said. "From an industry-wide standpoint, in 1972 there were some six billion bits of U.S. non-captive (non-IBM) semiconductor memory installed in computer systems," he continued.

"In the next few years — probably by 1976 — this is expected to climb to 50 billion bits of memory each year. And depending on our progress in penetrating the main memory areas, by 1980 it could be well over 100 billion bits installed annually," Longo said.

With this increase in volume will come a substantial reduction in price per bit. Although he said forecasting prices in such a volatile industry is difficult, he projected prices for MOS memory to average about 0.2 cent/bit during 1976.

Current prices, he said, are around 0.3 cent/bit in volume, whereas in 1972, the average was about 0.6 cent/bit, he said.

In the bipolar area, he sees prices going from 3 cent/bit today to 0.5 cent/bit in 1976. "This is about equal to the MOS prices of late 1972 so the superior performance of bipolar, competing with MOS price advantages will remain a factor in customers' decisions, he added.

In the battlefield of the main memory market, Longo said he expects solid state technologies beginning to take over by 1975-76, with competition between the semiconductor technologies. He said he sees the battle as a "cost versus performance struggle between N-channel MOS and bipolar."

Mass storage memory, such as disks, film and magnetic techniques, offers an "untapped area of potential," he noted.

Many firms in the industry are working on new device technologies that will bridge the performance and cost gap, now held by virtual memory, between the main memory system and mass storage areas, Longo said.

Development of the magnetic bubble, and other techniques could have "significant impact" in disk and other storage areas, he said.

Over the next four years, Longo sees the marketplace breaking down relatively evenly between bipolar and MOS. In 1972, the marketshare held by semiconductor random-access memories (RAM) and read-only memories (ROM) was \$55 million, of which \$33 million was in MOS, \$22 million in bipolar.

By 1976, he said, MOS sales should rise to \$78 million, with bipolar in the \$70 million range.

## Fairchild Buys Cogar Plant To Expand MOS Facilities

MOUNTAIN VIEW, Calif. — Fairchild Camera and Instrument Corp. has signed a contract to purchase the Wappingers Falls plant which housed semiconductor operations of Cogar Corp.

The facility will be used to expand manufacturing capacity for metal oxide semiconductor (MOS) integrated circuits.

Fairchild also plans to expand its MOS capacity here.

**Road to Dominance - Part I****IBM Papers Project 360 Market Share**

This series on market penetration by the IBM 360 series examines analyses made by IBM of the market from 1967 through 1969. Part II on Page 36 looks at the reduction suffered by IBM competitors by 1969. Part III, on Page 37, examines the share achieved by IBM in each sector of the systems market.

By Alan Taylor

Special to Computerworld

The competition against IBM's System/360 during the last years of its marketing life diminished fast, dropping from 36% of the average market to under 20% in the two years before 1970, according to newly available IBM documents released in the Greyhound-IBM suit.

Moreover, the hold over any particular market segment by any of the competitors was unstable, and indicated the IBM umbrella, while possibly acceptable for the competition taken as a whole, was not able to help the fortunes of competitors individually.

To establish a solid base, we must look back to 1967 and survey the markets as seen from White Plains then. IBM did its competitive analysis in seven marketing areas labeled A for the large Model 90 through F for the small Model 20 market (See Figure 1).

At the end of 1967 only in the hard-wired Model 75 system area, which had always been an oddity of the 360 range

area from the smallest 360/20, to the large time-sharing virtual 360/67s was over 70%. Here they were outselling all competition by 2-1, with the fabulously

**Analysis**

successful Model 50s pulling 88% of the orders in that area.

The documents show some confusion and much variation in the competitive situation.

**14 Competitors**

Even so, there were 14 different cases shown where a specific competitive firm held more than 4% of one of the IBM defined markets (Figure 2).

Undoubtedly, these segments could be used to show that competition was able to grow under IBM's umbrella and possibly

disprove the Justice Department's charge that IBM was somehow monopolizing the market. This was in spite of IBM figures showing over 70% IBM occupation of the U.S. Model 20 through 67 markets.

The picture in 1967 was in many ways just one-dimensional. The fortunes of IBM and its competitors were shown only at one point in time.

**Events Reveal**

Luckily, IBM figures allow us to see what happened to the IBM 20 through 67 70%-penetration block, and what happened to the 14 competitive markets during the next two years.

Theoretically, the idea of system generations should have caused the IBM penetration (as measured by system orders) to decrease during this period, as the new System 370s were about to replace the 360s.

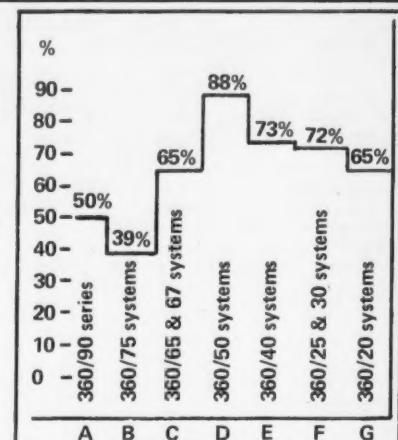


Figure 1. IBM Position in U.S. Computer Markets Before Justice Sued (1966/67). (Source: IBM's Commercial Analysis, Feb. 9, 1970)

What actually appeared to happen, however, was very different for both competition and IBM itself. On page 36, we paint the picture of competition and of IBM itself as the 360 marketing life was closing down.

Firm	Range	1966/7 Share
Burroughs	A (360/90s, 195s)	100%
	D (360/50s)	8%
	E (360/40s)	10%
Control Data	B (360/75s, 85s)	31%
	C (360/65s, 67s)	12%
General Electric	C (360/65s, 67s)	5%
Honeywell	E (360/40s)	4%
	F (360/25s, 30s)	10%
	G (360/20s, System 3s)	12%
RCA	E (360/40s)	10%
	F (360/25s, 30s)	4%
Univac	B (360/75s, 85s)	30%
	C (360/65s, 67s)	17%
	G (360/20s, System 3s)	22%

Figure 2. The IBM 1967 figures show competition with more than 4% of any of the marketplaces of the System 360 in 14 cases. These set the scene for the story of 1968/69 competitive activity.

and which had been kept over from non-microprogrammed processor times, was combined competition able to sell more equipment in a marketing range than IBM.

The success stories were in the lower, less powerful systems. A solid block of these existed.

The average market penetration in the

### Australian Post Office Seeks Bids for Network

Special to Computerworld

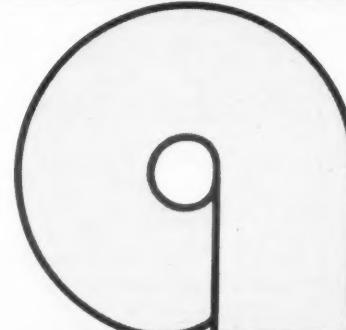
CANBERRA, Australia — The Australian Post Office (APO) has released a hardware-software RFP for a national computing network based on Sydney and Melbourne as two main processing centers.

Smaller satellite centers in Melbourne, Sydney, Brisbane, Adelaide, Perth and Hobart will be linked by high speed communication lines. The proposal is expected to be worth over \$28.5 million.

The bids close June 6 with completion of benchmarks by July 7. Main characteristics of the network are: on-line data entry; direct access storage; and modular programming with a common framework. Hub of the network will be four large systems, two in Sydney and two in Melbourne. These systems will contain approximately 1M bytes of main memory.

# COMPARE 370 LEASE PLANS

	IBM	alanthus
TERM	4 YEARS	4 YEARS
RENTAL	100% MAC	88% INCLUDING MAINTENANCE
2 YEAR TERMINATION PENALTIES	6 MONTHS RENT	2 MONTHS RENT
ITC	4 2/3 %	7%
RENEWAL	ANNUAL EXTENSIONS	MONTH TO MONTH
		In addition; call us for our unmatched 7 & 8 year financial leases.



**alanthus**

ALANTHUS CORPORATION

The 370  
Leasing Company

White Plains, N.Y. (914) 428-3703

Oak Brook, Ill. (312) 654-4635

Palo Alto, Calif. (415) 326-0750

Atlanta, Ga. (404) 252-2991

Firm	Range	1966/7 Share	1968/9 Share
Burroughs	A (360/90s, 195s)	100%	-23% Share; Wiped out
	D (360/50s)	8%	5% Share; 37% off
	E (360/40s)	10%	8% Share; 20% off
Average Corporation Position: 52% of 1967 Market Share Gone			
Control	B (360/75s, 85s)	31%	17% Share; 44% off
Data	C (360/65s, 67s)	12%	7% Share; 58% off
Average Corporation Position: 51% of 1967 Market Share Gone			
General Electric	C (360/65s, 67s)	5%	2% Share; 60% off
Average Corporation Position: 60% of 1967 Market Share Gone			
Honeywell	E (360/40s)	4%	5% Share; 25% up
	F (360/25s, 30s)	10%	6% Share; 40% off
	G (360/20s, System 3s)	12%	3% Share; 75% off
Average Corporation Position: 30% of 1967 Market Share Gone			
RCA	E (360/40s)	10%	7% Share; 30% off
	F (360/25s, 30s)	4%	2% Share; 50% off
Average Corporation Position: 40% of Market Share Gone			
Univac	B (360/75s, 85s)	30%	27% Share; 10% off
	C (360/65s, 67s)	17%	7% Share; 60% off
	G (360/20s, System 3s)	22%	6% Share; 70% off
Average Corporation Position: 47% of Market Share Gone			

Figure 1. The significant (4% or above) market shares held by IBM competitors in 1967 are compared with the equivalent holdings for the same companies in the same marketplaces for the following two years.

## The Road to Dominance - Part II

# IBM Papers Reveal Changes in Market Penetration by 360s Between '67, '69

By Alan Taylor

Special to Computerworld

During 1968/69 the IBM White Plains commercial analysis watch on the 360-competitive marketplace showed some drastic changes compared with 1966/67, particularly at the top and bottom market ranges where competition appeared to have had its strongest hold.

For the top end, the two-year averages ended 1968/69 when compared with the two year averages ended 1966/67, showed IBM had totally captured the suddenly booming super-scale computer market with net orders of 18 Model 360/195s.

This moved IBM's figure from 50% to 100% of the net orders. The two competitors in the marketplace, Burroughs and Control Data, suffered from cancellations of the orders given in 1966/67 for systems making them ineffective in the one area where they appeared to be strongest.

At the low end the introduction and success of

the IBM System/3 had boosted the IBM share of the market from 65% to 87%. IBM, a year after the filing of the Justice suit, was now out-selling the combined competition by 7-1 in a marketplace that had also apparently been a secure haven for Honeywell (down by 75%) and Univac (down by 77%).

IBM gains had also been scored in the Model 65 area (increasing its percentage from 64% to over 80%); in the Models 25/30 area (72% to 75%); and in the Model 40 area (73% to 75%).

Even where IBM had suffered a total disaster as it had with the Model 85 — which had not gained a single order in 1969 — the IBM percentage had still increased from 39% to 51%. Nowhere had there been even a slight IBM decline in any System 360 market!

The strong 1966/67 Burroughs showing in the Model 25 through Model 50 marketplaces peaking at 15% against the Model 40 marketplace was vanishing. Although the Model 40 marketplace was expanding 10% a year, the Burroughs sales of the B3500 were coming down. The 1967 peak of 134 Burroughs orders

## Analysis

had been reduced to a 1969 figure of only 69 — nearly cut in half.

Similarly in the Model 25/30 marketplace, the Burroughs orders, which in '67 had peaked at 165 systems, had by 1969 been cut to only 59 systems.

Nor was the picture much brighter for Burroughs in the Model 50 marketplace. Their penetration had decreased by 37%.

This was discouraging for as a new system, the Burroughs B6500 had been announced some years after the competing 360/50. Clearly, if a six-year-old Model 50 could outsell the B6500, a new IBM announcement could be expected to wipe it out.

### Honeywell Orders Halved

Honeywell, the only other non-IBM manufacturer to have apparently achieved a "protected" market (through having sizable entries in three contiguous markets) was also having its problems.

White Plains figures indicated a much faster Honeywell sales drop was occurring than in the equivalent IBM series. By 1969 the Honeywell 200 netted only 50 systems, down by 190 from the '66 peak of 240.

True, these orders were being augmented by the newer Honeywell 125 (similar to the IBM 360/25 augmentation of the 360/30). Even so, this was only taking 36 systems in 1969. Some dwindling support was also available from the Honeywell 1200, now down to 23 from its 1967 figure of 82 orders.

In all, the 1969 figures for the marketplace showed the Honeywell market opposite the 360/25/30s with only 110 net orders, about half its 1967 figures of 201.

The Model 20 type marketplace was one of the two great expansion marketplaces of 1969. It had now tripled in size to 6,000, from the 1967 figures of a net of 1,833 systems.

Honeywell's proportion, however, had not tripled. In fact Honeywell had not even maintained its '67 sales rate, dropping from 275 systems in 1967 to 143 in 1969.

### Univac Replaces CDC

In fact the only market opposite the System 360, which now looked to be open, was the "B Market" — the 360/75 and 85 market. Here the Univac 1108, Model 2, had sold 18 systems in the past year, abruptly taking over market leadership from the CDC 6600, which was down to only 3 systems in 1969, from 14 in 1968.

The IBM Models 75 and 85 gained 11 orders during 1969, and over the two

(Continued on Page 37)

**"Thanks to Computer Leasing Company I have \$120,000 more to spend on my programming staff this year alone!"**



Data Processing Managers know that the money CLC saves you is more than just green stuff. It's programmers, new software, a faster CPU, more memory. In short, it buys you whatever you need most to expand the productivity of your computer facility.

Or look at it another way. If you're under the gun to cut costs . . . to live within a shrunken budget . . . the CLC problem-solvers will show you how to do it without sacrificing that level of capability and efficiency you've worked so hard to achieve.

Mind you, we can't save everybody \$120,000 a year. (On the other hand, we are saving

some customers a great deal more than that.) But whether you need a single tape drive or an entire large-scale system, you can count on CLC for quick delivery of immaculate IBM and other computer hardware . . . for substantially less than you're paying now.

You may purchase, lease or rent the equipment. You will find that CLC offers more plans than the manufacturers, and we can give you just as much flexibility as they can.

It all starts with a call or letter to CLC. The sooner you do it, the sooner you can start enjoying the fruits of a wise decision.



2001 Jefferson Davis Highway • Arlington, Virginia 22202 • (703) 521-2900  
Los Angeles • San Francisco • Houston • St. Louis • Charlotte • Philadelphia • New York • New Haven

"The men who know their business get their computing equipment from CLC."

## PAY-RYTE

## COMPLETE PAYROLL SYSTEM

- IBM 360/370
- Burroughs-NCR
- Multi-Co./Div./Dept.
- Weekly, Bi-Weekly, Semi-Monthly, Monthly
- Salaried and/or Hourly
- Commissions-Bonuses, Etc.
- Up to 99 Pay Codes
- Up to 99 Deduction Codes
- 27 Deductions/Employee
- State & Local Tax Routines
- All Pertinent Reports (14)
- Checks - 941 A's - W2's
- Complete Documentation

\$4,800

(6500 Eff. 6/15/73)

## CONDATA, INC.

1809 Walnut Street  
Philadelphia, Pa. 19103  
(215) LO 9-4240

## Road to Dominance - Part III

## IBM Moves to 80% Market Penetration

By Alan Taylor

Special to Computerworld

During the last years of the marketing life of the System 360, IBM's position was analyzed by their own competitive analysts as a part of the competitive process. These figures have now been studied and the results are shown in Figure 2.

This shows the penetration IBM had made in each of the marketplaces in 1967, and by

## Analysis

the end of 1969, and the percentage change involved during 1968 and 1969.

Going down this market-by-market summary it can be seen that in only one of the seven markets - Market D - was IBM at the 80% level in 1967.

By contrast at the end of 1969, when the 360 was about to be replaced, it had achieved (and indeed over-shot) the 80% market level in three more markets, making a total of four markets - A, C, D and G - where it now held this powerful position.

The total average penetration was also up, according to the IBM figures. While in 1967 the average over the whole marketplace including the 370/75 and

Market	1966/7 Share	1968/9 Share	Comparison With 81% "Almost Complete Domination" Level
A (360/195s, 90s)	50%	100%	Domination Achieved 1969
B (360/75s, 85s)	39%	56%	ACD still two more years off, if this trend continues
C (360/65s, 67s)	65%	82%	Domination apparently achieved, 1969
D (360/50s)	88%	89%	Domination retained
E (360/40s)	73%	77%	ACD just four percentage points off
F (360/25s, 30s)	72%	74%	Moving up slowly
G (360/20s System/3s)	65%	87%	Domination Apparently Achieved in 1969
All 360 Market Average	64.5%	81%	"Almost Complete Domination" Achieved in 1969

Figure 2. IBM Market Shares held in 1967 are compared with equivalent shares in 1969.

up was 64.5%, the new advances had driven market penetration up to a position over 80%.

In fact, as shown by the IBM figures, as the 370 was being prepared for market, IBM was still receiving 81% of the new orders for System 360 markets.

This 81%, which turned out to be the average IBM-recorded penetration right across the 360-board, was mentioned in another part of the same documents containing the IBM figures.

It was defined, fairly explicitly, as being ALMOST COMPLETE DOMINATION - an item that

may interest many people who have tried to define this term for years.

This definition occurs in conjunction with the activities of one of the smaller U.S. computer manufacturers, Digital Equipment Corp.

While noting that the competition (offering 44 different computers from a score of manufacturers) had racked up 470 sales against the IBM 1130, the analyst, J.S. Cassidy commented that "DEC continued its almost complete domination of competitive activity in this category. Over 81% of competitions' net orders for the year come from this company's systems."

So - it looks as though IBM had moved forward to "almost complete domination" of the 360 marketplace by the end of the 360 market life, despite the Department of Justice's and the other antitrust suits.

## Market Shares Change

(Continued from Page 36) year period were solidly in the lead.

Again, this replacement of Control Data by Univac, and the fortunes of Burroughs and Honeywell demonstrated the lack of stability of any manufacturer within any 360 market.

The IBM-created 1969 figures indicated an increasing trend of IBM success in penetrating the total marketplace opposite its 360 line from the System/3 through the giant 360/195.

Still, even though by 1969 IBM had increased its share from the 65% average of 1967 - was this in itself justification for the Justice Department suit?

Mere bigness is not necessarily an evil, according to the law. Nor is growth. What is important is the question of domination.

## Pertec Names Poppa President

LOS ANGELES - Ryal R. Poppa has been named president and chief executive officer of Pertec Corp. He succeeds Harold A. Kurth, who resigned last December as part of a settlement of a proxy fight waged by dissident shareholders.

## Executive Corner

■ Joseph J. Ciasullo has been named vice-president and controller of Sperry Univac.

■ Joseph D. Koenig has been named a vice-president of Diablo Systems, Inc.

## Position Announcements

## PROFESSIONAL SYSTEMS ANALYSTS

We seek analysts looking for a challenge, who want to roll up their sleeves and get a job done. Must be well versed in interviewing users, defining problems, examining alternatives and writing design and programming specifications. Should have demonstrated outstanding ability in any of these areas:

- Financial Systems
- Residential Construction Systems
- Material Control Systems

We offer excellent salaries open and contingent upon experience. Working conditions and benefits are excellent and include cafeteria, vacation, sick leave, hospitalization, life and disability insurance and profit sharing.

Send resume to:  
Personnel Department  
GENERAL DEVELOPMENT CORP.  
1111 S. Bayshore Drive  
Miami, Florida 33131  
Equal Opportunity Employer

## CDC 3500 ANALYST

Experienced master analyst needed to work as senior analyst in a Data-center environment.

Candidates must have at least 2 years' O/S experience with the 3500.

Send resume or call collect:

Mr. Bill Smiley  
Multiple Access Limited  
885 Don Mills Road  
DON MILLS, Ontario  
CANADA  
(416) 443-3981

## PROGRAMMER

The qualified applicant will have:

- 3 years COBOL experience in a business environment
- Some BAL experience highly desirable
- Must be promotable to systems analyst
- 3rd generation computer installed
- REI programming experience highly desirable

Only resumes with complete salary history will be considered. All qualified applicants will be contacted for a personal interview.

CARTE BLANCHE CORP.  
3460 Wilshire Blvd.  
Los Angeles, Calif. 90010

## SYSTEMS ENGINEER

Due to an inter-company transfer, Ortho presently has an opening in our Data Processing Dept. for a creative, self-starting professional with a minimum of 4 years in a 360/DOS environment with solid exposure to assembler & COBOL languages & multi-programming.

Duties will include responsibility for the total Systems Engineering function on a 360/30/DOS environment that plans a transition to 370/DOS environment within the next year. Functions will cover systems generation, software development & evaluation, spooling & multi-programming duties and overall researching of the operating characteristics of the computer equipment.

This is an excellent opportunity to join a leader in the pharmaceutical industry at a critical stage in the development & growth of its data processing function.

Qualified individual should forward their resume with present salary & requirements in strictest confidence to Robert T. Moran, Manager, Employment.



ORTHO  
PHARMACEUTICAL  
CORPORATION

(A Johnson & Johnson Company)  
Route 202, Raritan, New Jersey 08869

an equal opportunity employer M/F

triple storage capacity per reel  
dual speed/dual density  
multitrack error correction  
increased throughput  
1973 delivery

The 3600/3800 Series High Density Tape Subsystems from Storage Technology.



Always a step or two ahead.

STORAGE TECHNOLOGY CORPORATION  
2270 South 88th Street, Louisville, Colorado 80027, (303) 666-6581

POSITION ANNOUNCEMENTS	POSITION ANNOUNCEMENTS	BUY SELL SWAP	BUY SELL SWAP																																				
<b>DIRECTOR OF CAMPUS COMPUTING SERVICES:</b> <p>Must have sufficient technical background to undertake operation of large university complex encompassing both business and academic functions. Masters Degree and a minimum of 2 yrs. experience in computer services operation at the managerial level.</p> <p>Position open July 1, 1973—resumes accepted May 10 through May 31. Please submit to:</p> <p>Mr. H.C. Koelbi Director of Personnel Arizona State University Tempe, Arizona 85281 An Equal Opportunity Employer.</p>	<b>ASSOCIATE WANTED FOR LIBRARY SYSTEMS:</b> <p>Staff position reporting to Dean of Library Administration. Works with library units in developing systems using machine applications. Successful experience in systems and computer applications and course work in related fields necessary. University library experience desirable. Salary commensurate with experience. Usual benefits. Send resumes to:</p> <p>Robert O. Johnson, Chairperson Library Search Committee Room 600 Main Library University of Cincinnati Cincinnati, Ohio 45221 Phone: (513) 475-4471 An Equal Opportunity Affirmative Action employer</p>	<b>Buy Sell Swap</b> <b>FOR SALE</b> <p>Mohawk Equipment</p> <p>(2) 1320 Buffered Printers (2) 1105 Data Recorders with paper tape readers used to drive printers 7TR, 200 BPI 140 ch. (2) 1103 Data Recorders Communicator, 7TR, 200 BPI 80 ch.</p> <p>METRO DATA SYSTEMS, INC. Box 4697, Tulsa, Ok. 74104 (918) 932-2395</p>	<b>For lease by owner</b> <p>(for 18 months) available immediately 360/30 F all features 1403 N1 2540 3 or 4 2311 4 or 6 2401 Mod 2</p> <p>DCS Computer Services, Inc. 19 Rector Street New York, N.Y. 10006 (212) 248-6566</p>																																				
<b>TELECOMMUNICATIONS</b> <b>SYSTEMS PROGRAMMER</b> <p>Telecommunications programmer with minimum 4 years experience in programming message and date switching systems.</p> <p>Position is on Corporate Telecommunications Staff and involves programming of CDC Dual M-1000 switching computers for new applications and revision of current applications which are Data switching between center and IBM 360's and 1130's at 2000 BPS (soon to be 4800 BPS) and Corporate Worldwide Message Systems with Teletype Terminals.</p> <p>Salary commensurate with education and experience.</p> <p>Please mail resume including salary requirements to:</p> <p>MANAGEMENTS RECRUITING &amp; PLACEMENT CENTRAL OPERATIONS — CHRYSLER CENTER CIMS 417-04-11 P.O. Box 1919 Detroit, Michigan 48231</p>	<b>DATA PLANNER</b> <p>Corporate Telecommunications Staff position to plan and control data transmission applications. Technical knowledge of terminal and modem operation essential. Engineering degree and experience in Data systems analysis and planning desirable.</p> <p>Work with Corporate Information Interchange and other isolated data transmission systems. Technical and operational evaluation of modems, all classes of terminals, transmission facilities and multiplexing equipment.</p> <p>Attractive salary and outstanding employee benefits.</p> <p>Please mail resume including salary requirements to:</p> <p>MANAGEMENTS RECRUITING &amp; PLACEMENT CENTRAL OPERATIONS — CHRYSLER CENTER CIMS 417-04-11 P.O. Box 1919 Detroit, Michigan 48231</p>	<b>360/30</b> <b>SUBLEASE</b> <b>"SPECIAL SITUATION"</b> <p>We want the best price we can get for this 65K CPU with 1051/1052, whatever that price turns out to be!</p> <p>One year minimum, we would like to include three 2311s and a controller. Keep your present printer and 2540, replace the balance with our computer — at savings only you can determine!</p> <p>CW Box # 3852 60 Austin Street Newton, Mass. 02160</p>	<b>FOR SALE</b> <p>12 IBM 3021 Data Cells for IBM 2321 Data cell drives</p> <p>2 Friden 4201 Paper tape to Magnetic tape converter</p> <p>for additional information call:</p> <p>Henry Sharp USAA 4119 Broadway San Antonio, Texas 78288 (512) 824-9011, ext. 2288</p>																																				
<b>Attractive Rocky Mountain Location</b> <p>Major division of \$1 billion corporation requires Systems Programming Manager. Minimum of 5 years sophisticated OS/360/370 experience necessary, also knowledge of MFT, MVT, HASP, BTAM, QTAM, and TCAM. Must have proven ability to creatively solve problems in systems programming area. Management experience desirable. Experience in configuration analysis and configuration tuning helpful. Send resume and salary history to:</p> <p>CW Box # 3851 60 Austin Street Newton, Mass. 02160</p>	<b>WE WANT TO BUY:</b> <p>Teletype Model's 28 • 33 • 35 Any condition — whole or parts</p> <p>Modems — Couplers — Other Data Communication Equipment</p> <p><b>WE ALSO SELL THE ABOVE</b> Call or Write: DATA COMMUNICATION EQUIPMENT BROKERS, INC. 1900 Thunderbird Street Troy, Michigan 48084 (313) 689-2640</p>	<b>2030 SYSTEM FOR LEASE</b> <table border="1"> <thead> <tr> <th>TYPE</th> <th>MODEL</th> <th>SERIAL NO.</th> </tr> </thead> <tbody> <tr> <td>2030</td> <td>F</td> <td>15405</td> </tr> <tr> <td>1051</td> <td>N1</td> <td>51582</td> </tr> <tr> <td>1052</td> <td>6</td> <td>61620</td> </tr> <tr> <td>1403</td> <td>N1</td> <td>31988</td> </tr> <tr> <td>2501</td> <td>B2</td> <td>20192</td> </tr> <tr> <td>2520</td> <td>B3</td> <td>20115</td> </tr> <tr> <td>2821</td> <td>02</td> <td>20347</td> </tr> </tbody> </table> <p>Data Automation Company 4858 Cash Road Dallas, Texas 75247 Ron Johnson (214) 637-6570</p>	TYPE	MODEL	SERIAL NO.	2030	F	15405	1051	N1	51582	1052	6	61620	1403	N1	31988	2501	B2	20192	2520	B3	20115	2821	02	20347	<b>FOR SALE BURROUGHS</b> <table border="1"> <thead> <tr> <th></th> <th>Orig. Cost</th> <th>Sale Price</th> </tr> </thead> <tbody> <tr> <td>1 — A149 Card Punch</td> <td>\$5900.00</td> <td>\$2850.00</td> </tr> <tr> <td>1 — A509 Card Punch Control Unit</td> <td>1200.00</td> <td>600.00</td> </tr> <tr> <td>1 — PF3 Dual Pin Feed</td> <td>500.00</td> <td>250.00</td> </tr> </tbody> </table> <p>YELLOW CAB DENVER, COLO. (303) 893-6464</p>		Orig. Cost	Sale Price	1 — A149 Card Punch	\$5900.00	\$2850.00	1 — A509 Card Punch Control Unit	1200.00	600.00	1 — PF3 Dual Pin Feed	500.00	250.00
TYPE	MODEL	SERIAL NO.																																					
2030	F	15405																																					
1051	N1	51582																																					
1052	6	61620																																					
1403	N1	31988																																					
2501	B2	20192																																					
2520	B3	20115																																					
2821	02	20347																																					
	Orig. Cost	Sale Price																																					
1 — A149 Card Punch	\$5900.00	\$2850.00																																					
1 — A509 Card Punch Control Unit	1200.00	600.00																																					
1 — PF3 Dual Pin Feed	500.00	250.00																																					
<b>PROGRAMMING MANAGER</b> <p>Com-Share Inc., a nationwide time-sharing firm, has an immediate requirement for a Manager of Operations Programming.</p> <p>The operations programming group has responsibility for software required to operate Com-Share's Computer Center, consisting of multiple Xerox 940, Sigma 7, and Sigma 9 computers. Software responsibility includes file maintenance, file transfer, archives, operator control, diagnostics, and statistics packages.</p> <p>This position requires system design capability. Applicants must be prepared to do top-down design and have 5 to 8 years experience with commercial data processing and operating systems software. Degree is required. Minicomputer and hardware experience would be useful.</p> <p>This position offers excellent technical growth potential with an exciting growing company. Reply with resume and salary history, in confidence, to:</p> <p>Personnel Office <b>COMSHARE</b> 3853 Research Park Drive Ann Arbor, Michigan 48104 an equal opportunity employer</p>	<b>FOR SALE</b> <p>NCR Century Series 100</p> <p>Available — Mid Summer CW Box 3847 60 Austin Street Newton, Mass. 02160</p>	<b>XEROX SIGMA 5 COMPUTER SYSTEM</b> <b>XEROX SIGMA 2 COMPUTER SYSTEM</b> <b>XEROX SIGMA PERIPHERALS</b> <p>QUELEX DATA SYSTEMS, INC. 8740 Shirley Avenue Northridge, California 91324 Phone — (213) 349-9711 TWX — QUELEX NTGE 9104931243</p>	<b>UNIVAC COMPUTER</b> <p>Minimum 25% discount from market value for 1005 system with 615 CPM card reader, 600 LPM printer and 200 CPM read-punch. Contact:</p> <p>R. W. Cotner St. Luke's Hospital Boise, ID (208) 342-7781</p>																																				
<b>Constant voltage Regulator for sale,</b> <p>Solatron L.V.R.</p> <p>13KVA—240volt—60 cycle unit Input: +10%—20%, 57 to 63 Hz Original cost was \$2,439 Will sell for \$1,950 or best offer. Unit has never been used.</p> <p>Contact: Ben Caldwell Escambia Treating Company P.O. Box 1710 Pensacola, Fla. 32598 (904) 433-2184</p>	<b>FOR SALE BY OWNER</b> <p>CUMMINS 216-02 OPTICAL DOCUMENT PROCESSING SYSTEM (Bar Code to 9 Track Magnetic Tape Scanner)</p> <p>Write or Call: Mr. E.R. Webster Data Processing Department Food Fair Stores, Inc. 3175 J. F. Kennedy Blvd. Phila., Pa. 19101 (215) 382-9500</p>	<b>FORSYTHE McARTHUR ASSOCIATES, INC</b> <b>PROFESSIONAL IBM COMPUTER DEALERS</b> <b>360/370</b> <b>BUY-SELL-LEASE</b> <p>*Call or Write*</p> <p>919 North Michigan Avenue Chicago, Ill. 60611 (312) 943-3770</p>	<b>WE PURCHASE- 360-20,30,40</b> <b>WE LEASE &amp; SELL- 360-20,30,40</b> <p>FREE ESTIMATES ON ALL YOUR EQUIPMENT</p> <p>WANTED: 029, 059, 083, 084, 026, 557 All 360/20 systems</p> <p><b>SIMPLICITY COMPUTER CORP.</b> 257 West 39th Street, New York, N.Y. 10018 • (212) 695-3010</p>																																				

BUY SELL SWAP

**360**BUY  
SELL  
LEASE  
SUBLEASE**FOR SALE  
360/30  
SYSTEM**

- 64K CPU, 1.5 MIC
- 2 channel, loaded
- \*1100 LPM Printer
- \*1000 CPM Reader
- \*1600 BPI Tapes
- 30KB, w/wo Dual Den.
- \*2311 Disks

AVAILABLE NOW

LUNCEFORD &amp; ASSOCIATES

Valley View Bank Bldg.  
Overland Park, Kan. 66212  
(913) 381-7272**FOR SALE  
OR LEASE**IBM 1401  
4K to 16K Systems  
with or without  
Tape Drives & Disks  
Savings in thousands.D.P. Equipment  
Marketing Corp.  
260 W. Broadway, N.Y. N.Y.  
CALL (212) 925-7737 Ext. 1**WANTED  
ALL 360 SYSTEMS**

1401 1440 2311 360/20  
360/30 360/40  
360/25

CORPORATE  
COMPUTERS, INC.

420 Lexington Avenue, New York, N.Y. 10017 (212) 532-1200

**BUY SELL LEASE TRADE  
360 - 370**  
CPU ... CORE ... I/O  
TAPE/DISC DRIVES  
CALL (612) 546-4422DATASERV  
EQUIPMENT

400 Shelard Plaza, MPLS. MN. 55426

**BEFORE  
YOU BUY****BEFORE  
YOU SELL****GO GREYHOUND**WANTED AVAILABLE FOR LEASE FOR SALE  
360/65 2314's 2365 Core 2040-gWRITE: Manager of Resale Equipment  
Greyhound Computer Corporation  
Greyhound Tower  
Phoenix, Arizona 85077

PHONE: (602) 248-5972

**We Need:**1419 MOD 1  
2311 MOD 1  
2415 MOD IV  
360/65**BUY  
SELL  
LEASE**FOR  
BETTER  
VALUE  
LOOK TO:**Available:**360/40-128K  
360/40-196K  
1403 MOD 111  
2821 MOD V**cac**COMPUTER ACQUISITIONS COMPANY  
P. O. BOX 80572, ATLANTA, GA. 30341 • (404) 458-4425**AVAILABLE  
IMMEDIATELY**360/20 C1, 8K  
2203  
2560 (1575)CMI CORPORATION  
16225 East Warren Avenue  
Detroit, Michigan 48224  
(313) 889-0440THE  
AMERICAN  
COMPUTER  
EXCHANGE  
INC.ANNOUNCES A NEW  
CONCEPT IN  
COMPUTER MARKETINGAn EDP EQUIPMENT EXCHANGE  
on which your company lists  
its equipment. Buy-Sell-Lease  
Sub-Lease or Finance

Benefits? One outlet for:

- National and  
International Mailings
- Broker/Dealer Mailings
- National Advertising
- Assistance in Sale/Purchase
- Transportation and  
Installation Arranged
- Assistance in Lease/  
Finance Packages

Payment for equipment goes  
directly from Buyer to Seller!!!!Cost? No charge for subscription  
or "Buy" listings.

\$25 for "Sell" listings

5% Service Charge paid by Seller  
Information?Call ACX at (216) 464-3881  
or write to: ACX  
24500 Chagrin Blvd.  
Beachwood, Ohio 44122**WANTED****NCR 395, 400****BURROUGHS  
L2000 to L5000****Mohawk Data****Burroughs Card Punch**

Model A 149

Call Stuart Rubenstein

**I.O.A. Data Corp.**  
383 Lafayette St., N.Y. 10003  
(212) 673-9300WE  
BUY • SELL  
LEASE • RECONDITION  
**TELETYPE®**Machines — New, Used  
Basket Cases

- Models 28, 32, 33, 35, 38
- BRPE's • CRT's • Couplers
- Enclosures • Modems

NAT'L TELETYPEWRITER CORP.  
23 Cain Dr., Plainview, N.Y. 11803  
(516) 293-0444**SELLING  
YOUR COMPUTER?**All models  
**WANTED**

Also Teletypes &amp; Terminals

Free Appraisal

ABLE COMPUTER  
CORP.625 Bard Ave.  
Staten Island, N.Y. 10310  
(212) 273-3721**FOR SALE OR LEASE****BY OWNER****360/40****Model G or H**

Call or Write

Mr. D.R. Tebo

C.I.S. Corp.

Midtown Plaza

Syracuse, N.Y.

(315) 474-5776

**XDS SIGMA 7**

Immediate Availability

XDS maintained, excellent condition,  
wide range of peripherals and options. Priced for quick  
movement.

Contact Harvey Mundee

(213) 882-5540

Valley Computer

A Division of Tymshare, Inc.

20923 Plummer Street

Chatsworth, Calif. 91311

**DAS**

FOR SALE OR LEASE

360/20/30/40 CPU's  
& Systems 1401, 1440,  
1620, 2311, 2841,  
Univac 9200 System

All Types Unit Record

**LEASE OR LEASE PURCHASE**

Two 1401-16K with 729's

One 1401-12K with 729's

CALL or WRITE

Data Automation  
Services, Inc.

4858 Cash Road

Dallas, Texas 75247

(800) 527-6148

318 W. 28th Street

Los Angeles, Calif. 90007

(213) 747-0587

7750 N.W. 7th Avenue

Miami, Fla. 33150

(305) 693-3911

**AVAILABLE  
FOR SALE OR  
LEASE**IBM 729 Magnetic Tape Units,  
Models II, IV, V and VITHE HALSEY CORPORATION  
1367 Central Avenue  
Middletown, Ohio 45042  
(513) 424-1697**FOR SALE**Two 128K Units Of  
**IBM CORE**  
for 360 model 40Call or Write  
Programming Manager  
P.O. Box 44  
Wall Street Station  
New York, N.Y. 10005  
(212) 944-4900 Ext. 644**FOR SALE**  
(2) 2030-F - FEB.1 & 2 Channel, With  
Compatibility1403-3 — Now  
1403-2 — Now  
2415-II — MarchSALE/LEASE/  
LEASE-PURCH.**HONEYWELL**  
1200 - 32K  
TAPE-DISK SYSTEM  
AVIAL - MAY 1973ACS Equipment Corporation  
8928 Spring Branch Drive  
Houston, Tx 77055  
(713) 461-1333**SYSTEM 360/370**dearborn  
computer leasing  
corporation

A business relationship you can't afford to be without ...

- Lease Terms to Fit Your Needs
- Field Engineering Support
- Systems Engineering Support
- Well Trained Marketing Staff

- Buy and Sell-360s • Subleasing
- Member, Computer Lessors Association

Dearborn Computer Leasing Corporation  
a subsidiary of Dearborn-Storm

4849 North Scott Street / Schiller Park, Illinois 60176 Area 312 / 671-4410

**MAGNETIC TAPE**

1600 BPI 800 BPI

recerti-  
fieduncerti-  
fied

2400 \$6.00 \$3.50

1200 5.00 3.00

seals thinline thickline

IBM Memorex Scotch

released from GEOPHYSICAL Archives

not work tapes

(713) 772-5557

C.A.R.D.

7575 Bellaire Blvd.

Houston, Texas 77036

**Two  
Burrough's  
TC 500**

for sale at substantial discount.

Inquire

Total Resources, Inc.  
(516) 488-7013**• LEASE • BUY • SELL •****370****LEASE PLANS****3 YEARS & LONGER****LOWEST RATES**

THOMAS COMPUTER CORPORATION

625 N. Michigan Ave.

Chicago, Illinois (312) 944-1401

Before you Buy—Lease—Sell

**360-370**

CPU—TAPE DRIVES—DISK DRIVES—CORE—I/O

call collect or write:

COMDISCO, INC.

2200 E. DEVON AVENUE

DES PLAINES, ILLINOIS 60018

TELEPHONE 312-297-3640

THE LARGEST DEALER IN THE WORLD SPECIALIZING  
IN MARKETING PRE-OWNED IBM EQUIPMENT**360/25****1130**360/25 (16K) with 1401 Com-  
patibility, 2540, 1403-N1, 2415  
available immediately for sale or  
lease. Excellent replacement for  
1401 or 360/25 on rental.

CALL or WRITE

Data Automation  
Services, Inc.

4858 Cash Road

Dallas, Texas 75247

(800) 527-6148

318 W. 28th Street

Los Angeles, Calif. 90007

(213) 747-0587

7750 N.W. 7th Avenue

Miami, Fla. 33150

(305) 693-3911

CALL or WRITE

Data Automation  
Services, Inc.

4858 Cash Road

Dallas, Texas 75247

(800) 527-6148

318 W. 28th Street

Los Angeles, Calif. 90007

(213) 747-0587

7750 N.W. 7th Avenue

Miami, Fla. 33150

(305) 693-3911

IPS IPS COMPUTER MARKETING CORP.

467 Sylvan Ave., Englewood Cliffs, N.J. 07632 (201) 871-4200

BUY SELL SWAP	BUY SELL SWAP	BUY SELL SWAP	BUY SELL SWAP	BUY SELL SWAP
<p><b>SALE or LEASE</b> Immediate Availability on IBM M/A 1401 C5-12K • 1402 • 1403 • 1406-2 360 D2 • 2020 D2 • 1442-5 • 2501-A2 • 1403-2 • (2) 2311-11 360 D2 • 2020 D2 • 1442-5 • 2501-A2 • 2203A-1</p> <p><b>I.O.A. DATA CORP.</b> 383 Lafayette St., New York (212) 673-9300</p>	<p><b>Current Inventory</b> <b>SALE</b> All this Unit Record Equipment in stock and ready to ship at money saving sale or lease prices. RARELY OFFERED: 046, 029, 059, 407, A3, 548, 557, 087, 088 OTHER FINE MODELS: 024, 026, 056, 077, 085, 402, 403, 407, 514, 519, 523, 552, 602, 604, 521, 826 • D.P. Equipment Marketing Corp. 260 W. Broadway, N.Y. N.Y. (212) 925-7737 Ext. 1</p>	<p><b>SALE/LEASE</b> 360/20's C1-8K, 2203 A1, 2560 A1, C1-8K, 1403-7, 2560 A1, BC2-12K, 1403-2, 2520 A1, 2501 A2 D2-16K, 2203 A1, 2560 A1, (2) 2311 - 2415-1 <b>LEASE</b> 2050 H, HG, I-CPUs <b>WANTED NOW</b> 360/30 E Full System 360/30F CPU, 1051, 1052 All I/O Units ALL MODEL 360/20's</p>	<p><b>FOR SALE OR LEASE</b> 024-\$350; 026-\$1300; 056-\$275; 077-\$600; 082-\$1,000; 083-\$2900; 085-\$1800; 088-\$6000; 402-\$1300; 403-\$1500; 407-\$3500; 514-\$1300; 519-\$1600; 548-\$2300; 552-\$1600; 557-\$3700; 602-\$400; 2311 (1) \$5000; 729 (5) \$2500; 729 (6) \$3000; 1448 (1) \$1000; 1401 systems \$17,500 &amp; \$35,000. THOMAS COMPUTER CORP. 625 N. Michigan-Suite 500 Chicago, Ill. 60611 (312) 944-1401</p>	<p><b>AVAILABLE</b> <b>FOR SALE OR LEASE</b> <b>SYSTEMS AND COMPONENTS:</b> IBM 1401 4K to 16K Card, Tape and Disk, IBM 7040 and 7070 Systems; IBM 1460 Components <b>THE HALSEY CORPORATION</b> 1367 Central Avenue Middletown, Ohio 45042 (513) 424-1697</p>

## PERSONAL: TO ALL EDP MANAGERS

FIRST NATIONAL BOSTON (FNB) . . . a top-ranking international financial institution with assets of over \$6.3 billion, is now leasing IBM S/360 and S/370 computers and peripherals through an FNB affiliate, Randolph Computer Company. FNB's entry into computer leasing now provides the solid financial base required for highly flexible short and long-term computer leasing of IBM computers and peripherals by IBM users.

DURING 1972, LEASING OF . . . S/360 and S/370 CPUs and peripherals saved Randolph's computer-leasing customers over \$22 million in rentals . . . in just one year. These users of Randolph's computers, who number over 200, are distributed across all of the 12 major U.S. industry sectors, with small firms as well as large corporations sharing in cost-saving leases from Randolph. Financial institutions, too—the professional money managers—are well represented among the EDP users who analyzed financial alternatives, then selected the most flexible lease plan for them: a plan designed by RCC for their changing needs.

For your up-to-date lease plan, contact RANDOLPH, THE COMPUTER LEASING COMPANY, now:

- 537 Steamboat Rd., Greenwich CT, 06830, (203) 661-4200
- 8060 Montgomery Rd., Cincinnati OH, 45236, (513) 793-6060
- 530 "B" St., San Diego CA, 92101, (714) 232-6401

## Evergreen Computer and Financial, Inc.

**HOME OFFICE:**  
Suite 120  
9100 Bloomington Freeway West  
Bloomington, Minnesota 55431  
612/884-9751

**BRANCH OFFICES:**  
2720 Des Plaines Avenue  
Des Plaines, Illinois 60018  
312/298-7890

312 East Wisconsin Ave.  
Milwaukee, Wisconsin 53202  
414/276-0909

### FOR SALE

2030 F 1.5 (SN 16191)  
1990, 3237, 4456, 4465,  
4468, 5856, 4760, 6960,  
7520  
1051-N1  
1052-8  
2065 J (1 meg. byte 756K)  
Fabri-tek add on (SN 60075)  
7117  
1052-7  
2860-2  
2870-1  
2365-2  
(2) 2365 - 2 (SN 30289, SN 30314)

2030 D 1.5 (SN 18948)  
3237, 4427, 6960, 7520,  
7915  
1051-N1  
2030 D 1.5 mic 16K (SN 17207)  
3237, 4456, 4463, 4467  
2030 32K (SN 17426)  
3237, 6960, 7915, 4427  
1051-N1  
1052-8  
2365 - 13 (SN 30064)

### TO BUY

2520 - B1 1401 Tape and Disk System 1311-2  
(2) 1442 - N1 2821-2

## BUY-SELL-LEASE 360/20

**360**  
30/40/50



**370**  
145/155

**ECONOCOM**

Division of Cook Industries, Inc.  
2185 Democrat Road - P.O. Box 16902  
Memphis, Tennessee 38116  
901-396-8890 or 901-396-8600

**1400-360**  
Specialists in 1401, 1440, 360/20, 360/30  
**Hundreds of Satisfied Users**  
**Free Appraisal Service**  
**BUY-TRADE**  
**SELL-LEASE**  
**Call us last but Call Us!**  
Area Code 313-889-0440  
16225 E. Warren Avenue Detroit, Mich. 48224

**UNIVAC**  
UP TO 80% OFF  
SPECTRA 70/45  
418-II  
9200  
CALL: (617) 227-8634  
We BUY any Computer Peripheral or Teletype  
Send for FREE Price List  
**AMERICAN USED COMPUTER CORP.**  
15 School St.  
Boston, MA 02108

## 360/370 MARKETPLACE BUY-SELL-LEASE

**TLW**  
**COMPUTER INDUSTRIES**  
3570 American Drive  
Atlanta, Georgia 30341  
404/451-1895

WE ALSO HAVE TAPE DRIVES, DISK DRIVES & OTHER PERIPHERAL EQUIPMENT.

Offices In Chicago  
222 E. Wisconsin Avenue  
Lake Forest, Illinois 60045  
(312) 295-2030

## buy-lease-sell 370 & 360 EQUIPMENT

CIS PRESENTS ECONOMY IN IBM HARDWARE, and backs it up with an established reputation for service, dependability and a penchant for detail. No loose ends. Personal contact with experience gathered in the field combine to bring you maximum economy and razor sharp performance. Talk to a CIS man now. You know he'll deliver!

MIDTOWN PLAZA, SYRACUSE, NEW YORK 13210 (315) 474-5776

### Fairfield Memory

will buy 135, 145, 155, 165.  
Mod. 30, 40, 50, 65 CPU's.

**Fairfield Memory**  
will lease long-term 145.

### Fairfield Memory

will sell its own core  
for 30, 40, 44, 50,  
65, 67, 75.

(714) 557-9873

**Fairfield Memory**  
1792 Kaiser Drive, Irvine, Calif. 92664

BUY SELL SWAP	TIME FOR SALE	SOFTWARE FOR SALE	SOFTWARE FOR SALE	SOFTWARE FOR SALE
<p><b>we buy and sell</b> IBM Computer Systems &amp; Unit Record Machines NCR 31-32-33-395-400 Burroughs - L Series <b>marion</b> 84 Kennedy St. Hackensack, N.J. (201) 343-4554</p> <p><b>360/30-96K</b> DOS/GRASP II 6-2314, 6-2401-11 1403-N1, 2540, 1401 Compat ALL SHIFTS AVAILABLE OFF SHIFT-\$35/Hr. 8AM-6PM M-F 32K-64K Partition-\$50/CPU Hr. Tridair Industries 2500 Compton Blvd. Redondo Beach, Calif. 90278 3 Blks from San Diego Fwy. Jim Appleby (213) 675-9141</p> <p><b>Time for Sale</b></p> <p><b>CONNECTICUT</b></p> <p><b>COMPUTERISTIC</b> SUBSIDIARY OF <b>UNIROYAL</b> COMPUTER PROCESSING SERVICES 360/65 • 1256K • OS HASP RJE 360/50 360/40 360/30 BATCH PROCESS Call Collect: Cal Gould (203) 573-3000 George Errico (203) 573-2587</p> <p><b>ILLINOIS</b></p> <p><b>COMPUTER TIME AND SERVICES</b> \$14.50 per hour for computer time on 360-20 with 16K and 2-2311 Disks. Systems design and RPG programming for accounting, inventory control, production management, and sales analysis at equally low rates. Hysan Corp. 919 W. 38th St. Chicago, Illinois 60609 (312) 376-8900 X14</p> <p><b>360/55 OS-MVT-HASP</b> We will give flat price contracts on jobs regardless of how much running time is involved HF/II APT MPSX ICES BLISS CROSSTABS PICS PAYROLL SSP MPS PLAN SAS BMD PROJECT II ACCOUNTS PAYABLE ACCOUNTS RECEIVABLE GENERAL LEDGER General Purpose Simulation System Continuous System Modeling Program Urban Transportation Planning System 360 Block Time and Remote Batch Your Programs or Ours <b>Stat-Com</b> A Division of Statistical Tabulating Corp (312) 346-7300 Vern Brownworth</p>	<p><b>ILLINOIS</b></p> <p><b>NEED TIME</b> 360/65 DOS 512 K with 7080 Emulator 12 Tape Drives 16 2314 Disk Drives On and Off Line Printers Interested in Selling Block Time Five or Seven Days a Week Located in Chicago Central Business District Excellent Physical Facilities Will Provide Office &amp; Storage Call (312) 225-6800, Mr. Zimmer</p> <p><b>IBM 360/370 USERS:</b> <b>The Cost of Computer Time Just Went Down</b> Going through a Conversion? LET GOLDEN FIFTY MAKE IT EASIER FOR YOU, AND SAVE YOU TIME AND DOLLARS! <b>360/50</b> 256K 2314 (9 spindles) 7-3420-M7, (9 TRK 800/1600 BPI) 1-3420-3, (7 TRK 800 BPI), 2-1403N2 <b>360/50</b> 512K 2314 (9 spindles) 8-2401-M6, (9 TRK 800/1600 BPI) 2-1403N1 <b>OFFLINE PRINTER - CPU, TELETYPE TAPE CONTROL UNIT</b> (1600 BPI) 1403N1 <b>360/50</b> 512 or 256K Rates 8 A.M.-8 P.M.   8 P.M.-8 A.M. Weekdays \$65/Hour   \$55/Hour Weekends \$45/Hour <b>OFFLINE PRINTER RATES</b> 7 DAYS A WEEK - ALL HOURS \$20/HOUR ENJOY THE PRIVACY OF MODERN OFFICES SUPPLIED FOR DEBUGGING PROGRAMS, AND RESEARCH Ample Storage Space Provided Hank CALL: Roy Einreinholer or Dan Grey 312/583-5410 or 5411 COMPUTER SERVICE DIVISION 5320 N. Kedzie Ave. • Chicago, Ill. 60625</p> <p><b>NEW JERSEY</b></p> <p><b>S/360/50/40/30</b> 1287 2671 Paper Tape Reader ALL SHIFTS Call: Roy Einreinholer Popular Services, Inc. (201) 471-2577</p> <p><b>CALIFORNIA</b></p> <p><b>360/30-65K</b> New Modern Facility 1 Blk From San Diego Fwy in Long Beach, Ca. 4-1600/800 BPI 120 KB Tape Drives 4-2314 Disk Drives 140 3N1 • 2540 • 2 Sel Ch \$50/45/40 Signal Data Processing (213) 426-0516 Chuck McGlinchey</p> <p><b>NEW MEXICO</b></p> <p><b>CATALR</b> MAKES THE DOS RELOCATABLE LIBRARY USABLE... EVEN FOR COBOL Catalogs any compiler output without using object decks, tape drives, or complex JCL <b>\$ 99</b> Marcus Powell Associates 2694 Dodge Avenue, Pinole, Ca. 94564 415-758-6080</p>	<p><b>Is \$960 Too Cheap? How About \$62/Month?</b> That's all we charge for our SUPER/PAY System. A very comprehensive system ordered by over 30 top firms in the past year, who liked SUPER/PAY's features as well as price. -All COBOL — 48K or above -Variable or fixed input -Disk or tape-IBM or others -State and local taxes -DOS or OS -Unlimited deduction &amp; earnings -Vacation and sick leave accts. -Skill &amp; education profile -Outstanding documentation -30 day free trial Try the system as others have and we know you will like it. Ask about our General Ledger Accounts Payable &amp; Receivable available on the same plan. Call or Write Today Database Corporation 6430 Sunset Blvd. Los Angeles, Calif. 90028 (213) 461-4888</p> <p><b>CATS-A/R</b> OPEN ITEM ACCOUNTS RECEIVABLE Features include: *Billing *Automatic Cash Application *Inventory Interface *Multi-company Systems Schedule Under control of the CATS MASTER Systems Controller, provided FREE with the license of any of the CATS programs. Also available are: Accounts Payable-Cash Requirements, Accounts Receivable-Retail System, and Inventory Recordkeeping. For information contact: Tom Leonard, President COMPUTER WARES, INC. P.O. Box 31205, Birmingham, Ala. 35222 - Phone 205/595-0511</p> <p><b>asystance</b> THE FINEST GENERAL LEDGER AND FINANCIAL REPORTING SYSTEM AVAILABLE Featuring: • Conventional Report Generator • Graphic Report Generator • Matrix Report Generator • Responsibility Reporting • Flexible Budgeting Module • Multiple Currency Version to accommodate foreign subsidiary accounting</p> <p><b>asystance</b> 2610 Wycliff Road Raleigh, North Carolina 27607 (919) 782-7300 New York: (212) 586-5977</p> <p><b>AUTOCODER &amp; SPS</b> TRANSLATED AUTOMATICALLY to BAL &amp; PL/1 THE TOTALTRAN SYSTEM ... the most economical, practical and quickest method of converting to the 3rd and 4th generation. 3 SERVICES OFFERED: 1. 1400 Object to clean source decompilation 2. 1400 Clean source to BAL translation 3. 1400 Clean source to PL/1 translation Contact: W. Small, President</p> <p><b>CPU MANAGEMENT ADVISORY CORP.</b> 853 Broadway, N.Y. 10003 (212) 777-7722</p>	<p><b>SYSX</b> LOOKING FOR SOFTWARE? Free Software Search and Package Appraisal Service Our job is to help you locate the software packages which best meet your needs. There is no charge to you for this service. Write on your company letterhead or call: Systems Exchange Co. 1034 Colorado Ave. Palo Alto, Calif. 94303 (415) 328-5490</p> <p><b>SYSX</b></p> <p><b>MMS GENERAL LEDGER</b> is hard at work for over 60 of the biggest US corporations* TO FIND OUT WHAT THEY KNOW THAT YOU DON'T, CALL: Boston 617-272-2970 New York 212-972-9540 Chicago 312-256-2250 Atlanta 404-255-0039 Los Angeles (213) 437-3301 Software International Corporation 279 Cambridge Street Burlington, Ma. 01803 *so are Accounts Receivable, Accounts Payable, Inventory Management packages.</p> <p><b>Information Science Incorporated</b> New York 10956 914/634/8877</p>	<p><b>"KEY PUNCH" SERVICES</b> Fast, accurate and economical data entry services. Will deliver on 9 channel 800 BPI tapes. Send sample source document and volume and turnaround time requirements for quotation. CompuSys Inc. P.O. Box 11104, Albuquerque NM 87112. (505) 266-7977.</p> <p><b>How can one Computerized Personnel System accomplish so much?</b></p> <p>Here's what YOU can get from ONE Information Science system: ► SALARY Administration ► BENEFITS Administration and Statement ► LABOR RELATIONS (including Seniority) Features ► MEDICAL AND SAFETY Administration ► Full retrieval - includes GENERAL RETRIEVAL SYSTEM (GRS) for quickly requesting custom reports in English. ► Easily interfaced with your PAYROLL SYSTEM</p> <p>It's possible to accomplish all this AND MORE because Information Science has specialized in personnel information and payroll systems for 8 years. We have more than 160 clients to our credit.</p> <p>We have designed more successful Computerized Human Resource Systems than any other company in the world!</p> <p>Send to Dept. CW-4 for System Description.</p> <p><b>Computerworld Sales Offices</b></p> <p><b>Vice President — Sales</b> Neal Wilder</p> <p><b>Sales Administrator:</b> Dorothy Travis COMPUTERWORLD 797 Washington Street Newton, Mass. 02160 (617) 332-5606</p> <p><b>Northern Regional Manager</b> Robert Ziegel COMPUTERWORLD 797 Washington Street Newton, Mass. 02160 (617) 332-5606</p> <p><b>Mid. Atlantic Regional Manager</b> Donald E. Fagan COMPUTERWORLD 225 West 34th Street Suite 1511 New York, N.Y. 10001 (212) 594-5644</p> <p><b>Japan:</b> Yoshi Yamamoto Nippon Keisoku Inc. P.O. Box 410 Central Tokyo, Japan</p>

**ARGONAUT  
INFORMATION SYSTEMS, INC.**

**ACCOUNTS PAYABLE  
PAYROLL/PERSONNEL  
TAX BREAK (P/R TAX MODULE)**

P.O. BOX 112 WALNUT CREEK, CA. 94596

## Honeywell Quarter Earnings Soar 50%, HIS Performance Strong, Analysts Told

By Ken Shonk  
Of the CW Staff

WALTHAM, Mass. — Honeywell's executive officers displayed a strong sense of satisfaction with the company's first quarter earnings report at a recent meeting of analysts here. All divisions improved their positions, reported President Stephen F. Keating.

The information systems side

of Honeywell enjoyed a stronger first quarter than expected and Keating said indicators for the remainder of the year are strong.

However, he cautioned, "Don't expect earnings to increase in the remaining quarters of the year over a year previous at the same rate earnings improved this first quarter of '73."

Clancy Spangle, executive vice-president and chief of Information Systems, stated he expects a strong year for Honeywell.

"Acceptance of the Model 6000 has turned into a flood of orders," he said, "and the 2000 Series has experienced strong ordering. The value of the 50 and 100 Series systems was also greater than that of any previous year, and the company turned a profit in the minicomputer sector."

First quarter earnings for Honeywell, Inc. were up 50% to \$16.9 million from \$11.2 million in the year-ago period.

"We think we're in a fairly strong position to take advantage of the upturn in the demand for computer systems and services," he said.

### Outlook for 1973

The outlook in '73 points toward a better year than '72 according to Spangle. "Revenues should increase 12% to 15% for

the year with the growth rate in the U.S. running 10% to 12% and 15% to 18% outside the U.S. with all of Europe except Italy showing high growth rates."

The large number of Wimmex contract billings contributed to the strong first quarter, officials said. During the quarter 19 of 33 contracted systems were shipped.

Interest income was up 40%, company officials disclosed. Also, the yield of the 2000 Series systems hit its target of 18% to 20%, and the yield of the 6000 Series was much higher than expected since fewer 600s were returned than anticipated and most 400s and 600s were reshipped, they said.

"We're just coming out of a period of product line integration, and we're spending \$110 million on R&D.

"Our present R&D approach," noted Spangle, "is that all new designs should be applicable to as wide a use as possible, and that we'll come out with a new line when it is necessary to hold existing customers."

The breakdown on R&D budget expenditures at present is 35% for software, a small amount on advanced research, and the remainder on hardware engineering and development, he said.

## Microdata, Interdata Improve Quarter Earnings and Revenues

Two minimakers, Microdata Corp. and Interdata, Inc., both turned in sharply improved performances in recent quarters.

Interdata wound up the record quarter ended March 30 with earnings of \$272,500 or 13 cents a share compared with \$210,700 or 11 cents a share in the year-ago period.

The 1972 figure includes a \$146,800 special credit. In 1973, the special credit amounted to \$43,600.

Revenues rose 35% during the period, to \$3.8 million from \$2.8 million in the year-ago quarter.

The improved earnings resulted from a combination of increased volume and new production efficiencies, according to President Daniel Sinnott.

### More at Microdata

At Microdata, revenues rose 54% in the quarter ended Feb. 28, to a total of \$2.3 million compared with \$1.5 million in the year-ago period.

Earnings, including a \$136,000 special credit, reached \$283,985 or 17 cents a share compared with \$138,704 or 11 cents a share in the 1972 period, when a \$71,934 special credit was included.

Performance for the six months also improved, with revenues rising to \$4.2 million from almost \$2.7 million a year ago, while earnings totaled \$522,565 or 35 cents a share compared with \$253,524 or 20 cents a share.

Special credits for the periods were \$245,000 in 1973 and \$124,696 in 1972.

President Donald W. Fuller noted that component scarcity and in some cases poor quality of components delivered, has

## Hazeltine Boosts First Period Net

GREENLAWN, N.Y. — Orders for Hazeltine Corp.'s 2000 video display terminal nearly tripled over those of the 1972 first quarter, and shipments almost doubled, the firm reported recently.

Earnings for the quarter ended March 31 rose to \$441,000 or 22 cents a share from \$134,000 or 7 cents a share in the year-ago period.

Revenues climbed to \$17.9 million from \$11.6 million in the same 1972 quarter.

The company effected a 50% increase in first quarter marketing, engineering and related expenditures to support the continued growth of its Industrial Products Division, which makes terminals, automatic editing equipment and color film analyzers.

### Shipments Rise 20%

The division's shipments for sale and rental amounted to over \$4.4 million, a 20% rise over the 1972 quarter.

The Government Products Division's revenues and earnings increased significantly, the firm said.

Overall backlog rose to \$88 million from about \$82 million in the year-ago period. The Industrial Products Division's portion of the backlog increased to \$11 million from \$4 million a year ago and \$7.8 million at year's end.

# CALL FREE 800-453-5323

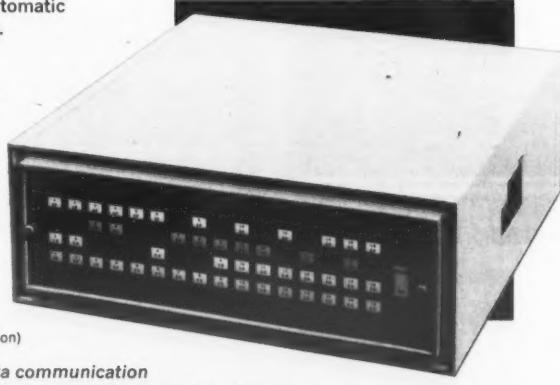
No matter what business you're in or where you are in the continental United States, a toll-free phone call will bring you complete information about our fast-selling data communication terminal, the UNIVAC® DCT-500.

UNIVAC DCT-500 Data Communication Terminal

**SPERRY+UNIVAC**  
Only when our customers succeed do we succeed.

A family of low-speed modems for the user or OEM. Here are eight models... many others to choose from.

Model 150A—Acoustic coupler for TTY only .....	<b>\$147</b>
Model 150P—Built-in acoustic coupler for Series 33 Teletype.....	<b>\$175</b>
Model 302A—Acoustic coupler TTY and EIA interfaces .....	<b>\$245</b>
Model 302D—replacement for 103A. Automatic answering with CBS or CBT DAA. TTY motor starter, initiate & respond to long space disconnect and 10 minute activity disconnect .....	<b>\$325</b>
Model 302F—replacement for 103F. Private line and 1000A, CDT DAA applications .....	<b>\$245</b>
Model 310—PC modem for OEM. Originate, acoustic/DAA, carrier detect, 4½ x 5½ x ½ .....	<b>\$125</b>
Model 320—PC modem for OEM. Answer/originate, acoustic/DAA, carrier detect, integral power supply. 4½ x 10½ x ¾ .....	<b>\$165</b>



**Series 330**—Replacement for 103A, 103F, 103E, 113A and 113B. Automatic answering with CBS or CBT DAA.

16 modems in a 19" rack. Colored display panel indicates 4 controls and 2 data functions.

Auto answer modem .....

**\$170**

Private line modem .....

**\$150**

Complete cabinet, display and 16 Modems .....

**\$3,185**

or \$73.00/month.

(5-year lease with purchase option)

Also a complete line of other data communication equipment including frequency division multiplexers, data channel expanders, data channel concentrators, Teletype terminals, etc. Write for specs today.

See us in Booth 2016, National Computer Conference

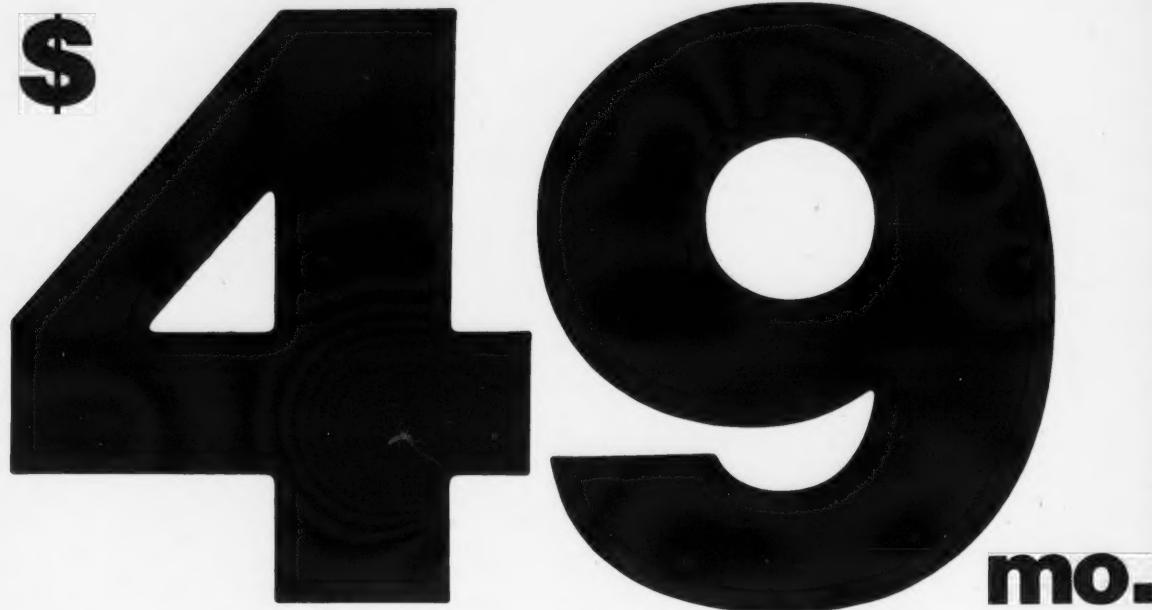
**ComData Corporation**

7544 W. OAKTON ST. □ NILES, ILLINOIS 60648 □ 312/692-6107

TORONTO CANADA □ 416/773-4161



# Hazeltine Introduces a New Era in Terminal Economy: Announcing The Hazeltine 1000.



12-month rental, maintenance included.

The low, low priced Video Display Terminal is here—and naturally it's Hazeltine. If you'd like the speed, flexibility and silence provided only by a CRT, then you'll love the Hazeltine 1000.

Full teletypewriter compatibility, 960-character display (80 x 12), your choice of transmission speeds up to 9600 bps as well as parity generation and checking. Options include upper/lower case, answerback and an auxiliary EIA output. All at a price that fits easily into your budget.

And of course standard equipment includes the unmatched performance and reliability you've come to expect of every product bearing the Hazeltine name.

Delivery is only sixty days, so call now for a demonstration.



## Hazeltine Corporation

Computer Peripheral Equipment Greenlawn, N.Y. 11740  
(516) 549-8800 Telex 96-1435

EAST: NEW YORK (212) 586-1970 □ BOSTON (617) 588-8700  
EDISON, N.J. (201) 828-5678  
PHILADELPHIA (215) 676-4348  
PITTSBURGH (412) 343-4449

MIDWEST: MINNEAPOLIS (612) 854-6555 □ CHICAGO (312) 986-1414  
CLEVELAND (216) 752-1030 □ DETROIT (313) 355-3510

SOUTH: DALLAS (214) 233-7776 □ ATLANTA (404) 458-9360  
HOUSTON (713) 622-0551  
WASHINGTON, D.C. (703) 979-5500

WEST: SAN FRANCISCO (415) 398-0686 □ DENVER (303) 388-8844  
LOS ANGELES (213) 553-1811